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SECRETARY STANTON:
THE MAN AND HIS WORK.

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THE American Rebellion, not less than the French Revolution, is worthy of its Carlyle, strong and wide of brain to grasp, and compact and racy of speech to depict, the scenes, incidents, and characters of the great drama. The time, however, has not yet come for the advent or labor of such a narrator. His eye would be distracted by a still disturbed and distorting atmosphere; his ear confounded by the yet sullen beating of waves upon the shore. Doubt and controversy, the offspring of passion and prejudice, sectional, factional, and personal, continue to circle about us, perverting truth and subverting judgment, and these caricaturing ghosts and shadows will not vanish till the gradual processes of nature shall bring us again into the full, clear light of day. Obedient, nevertheless, to the instincts of civilization, we toil at the shaping of the memorials of our own time, hoping against hope that those who come after us will accept our partial and purblind conceptions as the last, best result of all that we have been and done and suffered, and, in our vain conceit, unconsciously storing up priceless materials for the uses of posterity.

It is proposed in the following pages to consider briefly and, it is hoped, as impartially as present means of knowledge and

judgment permit, what place in history, if any, is reserved for the man whose name stands at the head of this paper. Some place would appear to belong to him in virtue of the important part he played in great events, and yet the obscurity in which his memory has chiefly lain since he went from among us stamps the fact as well as the character of his future with uncertainty. However that may be, he is still near enough to us in point of time, and our collective lives and fortunes have been so far affected by what he was and did, that a present, if but a transient, interest must attach to any sincere attempt to explore his nature and conduct.

Friends and enemies alike describe Mr. Stanton to us as a man of vigorous and impulsive intellect, resolute and energetic in action, cold and arrogant in demeanor, incorruptible and otherwise pure in personal conduct, and possessed by an almost superstitious sense of human dependence upon an incessantly and directly acting Divine Power. The intimates of his official and social life tell us that his intellect was intense rather than expansive, intuitive rather than logical, and romantic rather than realistic; that his firmness often meant sheer obstinacy, and his ardor raw haste and profusion; that a pungent humor lay beneath his reserve, and a winning sociability below his austerity; that he was devoted to domestic life; was keenly sensitive to a situation of pathos or distress, and that, in principle at least, he absolutely reverenced constitutionalism and legality.

The picture before us, then, is that of a man of restless, tenacious, and intolerant mind; often rash and speculative in judgment, unsympathetic and domineering in association, enthusiastic in conception, inapt and wasteful in method, capricious in temperament, and egotistical and fanatical in opinion. Yet such a man would apprehend deeply where he apprehended rightly; his ardor of mind would inspire him with confidence in the means, and trust for the end; his free-handed energy would open otherwise undiscoverable paths to fortune; his sense of humor would tend to link him to sober views of men and things; his furtive heartiness would win strong friends, if few; his homeliness and sensibility would impart perennial freshness to brain and heart; his inherent love of orderly courses would strip absolutism of its worst excesses and consequences, and his supernaturalism would endow him with a calm and persistent courage. Nor would the better side of his native qualities lack wholesome influence beyond himself. Laxity and indolence would melt before

his heated thought; despondency would find its antidote in the buoyancy of his mind; his intuitions would sometimes bear the stamp of genius; his fortitude would encourage unity; his lavish activity would enable golden opportunities to be reaped; his disinterestedness would shame greed and baseness; his high-placed conviction would stimulate seriousness and hope.

The character thus analyzed is one sure, in any time or circumstance, to gain ascendency by its force, arouse hostility by its aggressiveness, and kindle resentment by its heedlessness. But the mass of mankind will always value the qualities that lend strength, originality, and confidence to counsel; unity, integrity, and success to conduct; and activity, hope, and elevation to spirit; and where these are recognized, such alternatives as error of plan, miscarriage of effort, and despotic use of power to unselfish ends are consciously risked and patiently endured.

If we have rightly apprehended the native constitution of Mr. Stanton, he was a man of great merits and great defects; foredoomed, in any large sphere of activity, to contrasts of great successes with great failures, and certain to line his pathway through life with eager panegyrists and detractors. It next behooves us to consider him in relation to the special circumstances of his position in the cabinet of President Lincoln.

When Mr. Stanton took charge of the military affairs of the nation, the Government was engaged in a war that demanded the services of great armies at numerous points of a difficult and extensive field of operation. Nearly, if not fully, one third of the normal resources of the country were arrayed against the Government, instead of being available to it, and the nature of the struggle impaired the solidarity among those still within its allegiance that would have existed in presence of a foreign foe. Organization and equipment were chiefly the creatures of improvisation, and haste, inexperience, and confused administration gave wide scope to malversation. The very existence of the Federal Government being at stake, its credit declined as its needs increased. Patriotic endeavor had in some way to be extorted from partisan instincts and prejudices, and this in the face of a rampant factionalism in the ranks of the dominant and therefore exemplary party. The military and political sides of the burning and unquenchable question of slavery were in sharp antagonism, and the ascendency of either side portended ruin to the common cause. Lastly, the sudden and almost complete con-

version of the community to warlike habits and feelings threatened with present paralysis and, possibly, permanent modification, those free and regular methods of government that are the foundations of liberty. Such, in short, was the complex problem to the solution of which Mr. Stanton was unexpectedly called to lend material aid. To a man of his spiritual mould, the summons must have affected him with feelings akin to those of an evangelical devotee, who, "called" to "the Lord's work" on some distant and barbarous shore, joyfully takes up his staff, girds his loins, and hastens to the appointed field; there, unquestionably and fearlessly, to labor as he is "moved of the spirit," leaving the end and the justification to the source of inspiration. Continuing the sacerdotal comparison, we may imagine the newly-installed cabinet minister communing thus with himself in the presence of his high and perplexing duties: "Are resources lessened? The remnant must learn to bear heavier burdens. Hath spontaneity declined? There must be greater pressure from above. Is there emergency? We must inflame our zeal. Have usurers invaded the sanctuary? There must be scourgings. Are the tithes stinted? There shall be distraint. Do the Levites cabal? Our place is with the High Priest. Is Anti-Pope enthroned? We must restore the true succession. Doth the heretic rejoice in his harvests? We will send firebrands among his sheaves."

Much valuable, because contemporary and unpremeditated light is shed on Mr. Stanton's nature in the letter written by him to an old patron, in May of 1862.* Therein we discern the narrow intenseness of his mind in fears for Washington that take no account of the countervailing risk to the rebel capital; we detect impulsiveness in his confessed recent devotion to General McClellan upon the shadowy basis of simple hope without knowledge; we perceive mental weakness in the implication that a common leadership in vast military undertakings is not essential; we suspect dreaminess in a tactical plan of incessant hard blows at an enemy, without notice of strategetical conditions; we catch glimpses of an egotism and a repose resulting from faith in a Providence that letteth not a sparrow fall to the ground otherwise than as part of a Divine purpose. Passing to the domain of the affections, we rejoice in proofs of disinterestedness and public spirit in the writer, of love of private station, of veneration

* See letter in full, at the end of this article.

for constituted authority, and of fidelity to duty as a duty; but we recoil from an ingrained distrust of mankind, implied in the assumption that variance between the chief soldier of the Republic and himself must arise from want of patriotism in the former or his advisers.

If our knowledge of Secretary Stanton ceased absolutely at the point we have reached—that is, an apprehension and comprehension of the manner of man he was and of the nature of the situation wherein he was placed—how should we prognosticate his course of action and its results? In other words, what were the probable *a priori* conclusions of those persons of competent mind who knew him well in January, 1862, concerning the consequences of his accession to the control of our military concerns and to an influential place in the national councils? Should we not, and did they not, predict an immediate and all-pervading change in the tendency and spirit of public affairs, and those who administered them? Through every fibre and nerve of administration should we not, and did they not, look for new activity, vigor, firmness, and severity, with intensity and elevation of tone, and parallel with these, narrowness, bigotry, tyranny, rashness, impatience, and lavishness, so far as any man could possibly dominate a multitude? It only remains to ask if the man and his encompassment are not truly summarized in this epitome.

We cannot, however, do present justice to the memory of Mr. Stanton, or pretend to forecast his future, upon considerations chiefly if not wholly hypothetical. Trusting to the helpful and exculpatory tendencies of a right intention, we must venture to lay hold upon the more important of the controversies that embittered his life and still becloud his reputation, and see if we cannot apportion his meeds of praise and blame with approximate reason and justice. Of these controversies the greatest, of necessity, is the one wherein his name is indissolubly linked with that of General McClellan.

In the number of the *Century* magazine for May, 1885, General McClellan, clearly and with persuasive moderation, states his case against Secretary Stanton. The article has great historical importance because, firstly, it was written so long after the fact that much information not originally accessible was available to the author, and, secondly, the delay must have enabled the writer to choose with confidence the particular presentation of the issue upon which he was willing to go to posterity.

General McClellan tells us that, after providing for the immediate safety of the capital, his plan was to organize, equip, and discipline a numerous army with which ultimately to strike the rebellion a sure and staggering blow at Richmond; to fortify Washington against every possibility of successful assault when defended by a moderate garrison; to establish positions and garrisons along the Southern seaboard whereby to isolate the Confederacy from external aid; to use the Western forces to break up and hamper Southern communications with the insurgent capital; and, when all these preliminaries had been effected, to personally conduct the principal army against Richmond by way of Urbanna, the advantages of which route are indicated in the article. This plan, he partly alleges and partly suggests, was made impossible by the conduct of Secretary Stanton, who, immediately upon his accession to office, filled the Executive with an extreme impatience; spoiled the Urbanna route by insisting upon a premature clearance of the Potomac River and the line of the Baltimore and Ohio railroad; dislocated the inferior alternative of an advance up the Peninsula by unexpectedly stripping him of large bodies of his troops when too late to withdraw from the movement; imperilled his army by requiring him to leave his natural and intended base on the James River and stretch northward for a junction with reinforcements which never came, and, finally, gave a finishing stroke to the campaign by compelling its abandonment at the moment he had firmly established himself on his true line with victorious and seasoned troops, and had every reason to hope that success was now within his grasp.

Minor accusations and complaints in the article are that Mr. Stanton, after expressing great devotion to General McClellan (coupled with contempt for the administration), and assuring him that he took office solely to aid the General in his work, became almost inaccessible to the latter, broke up the free intercourse that had previously existed between the President and the General-in-Chief, and, by a gross misrepresentation to the latter, prevented him from removing from the President's mind an erroneous and injurious impression concerning certain abortive operations at Harper's Ferry for the relief of the railway route to the West.

Fair-spoken as the article is, and favorable as must be the impression of General McClellan that a surface perusal of it leaves on the mind, a careful reading discloses certain omissions

that somebody must supply before it can safely be accepted as the last words of the controversy. For example, the article is, and perhaps was intended to be, a strictly military statement of what is assumed to have been purely a military situation, the larger political question being in chief part ignored, and but slightly indicated at any point. General McClellan, when viewing only the military aspects of the problem, no doubt felt that to prepare for the offensive—which we were compelled to assume—involving invasions with long lines of operations, made time more necessary to us than to the enemy who could use his raw troops to advantage under cover of the natural defences of his country. But so intelligent a man, and one whose hand was in contact with the nerve-centres of the nation, must have known that extreme impatience had been the attitude of the country for some time before Mr. Stanton's predecessor vacated the office; that the entire administration was in discredit with large sections of the people; that the unity which had resulted from the burst of patriotism in the preceding April had largely declined to factionalism and indifference; that the chance for preservation of the Federal Government depended greatly upon the decision of a group of capitalists at New York, and that foreign intervention, to divide and weaken the dreaded Republic and extend the area of Free Trade, was so near an event that the intervals between the arrivals of the successive mail-steamers were spent by Messrs. Lincoln and Seward in absolute fear and anxiety. Here was every inducement to immediate and persistent action; yet General McClellan tells us, nearly twenty-four years afterward, that delay was part of a plan. In numbers, in equipment, in resources, we were greatly the superior of the enemy; in valor, discipline, and general and applied intelligence, we were at least his equal. His industrial system was such that it could maintain its vigor under the very circumstances that threatened ours with ruin, for while an agricultural community can only be prostrated by extraordinary and repeated visitations of nature, or protracted visitations of actual war, a commercial or industrial one is imperilled by every derangement of the artificial machinery that keeps it in operation. Delay was the one thing above all others that our enemy needed to destroy the odds in our favor, and that General McClellan, in May, 1885, tells us it was intended that he should have, not from unpatriotic motives, surely, but in order that a Federal army might be created, and a strategetical

situation prepared, fit for the humbling of the martial genius and the veteran legions of a Hannibal, a Frederick, or a Wellington.

With regard to the personal aspects of the issue, General McClellan leaves us to infer that Mr. Stanton's sudden change from devotion and subserviency to himself was due to inherent depravity or weakness of character,—an obviously inadequate explanation. It is not reasonably shown that Mr. Stanton was responsible for the changed attitude of the Administration toward the General; it may have been merely a coincidence that the change occurred about the time of the former's accession to the War Department, and this, *a priori*, is the more reasonable, because Mr. Stanton's appointment was due entirely to political motives, and a strong dislike then existed between the President and himself, arising out of a severe unpleasantness connected with a lawsuit some years before the war. If the new Secretary of War curtailed the direct access of the General-in-Chief to the President, he did a natural and proper thing, for he certainly had not agreed to become a simple head-clerk for the War Department, and he could not be expected to hold himself out to the public as responsible for the administration of the military branch of the Government unless he had the intermediate knowledge, control, and supervision of every thing appertaining to it.

Several months before the close of General McClellan's military career, and while it was still possible that he should be a great power for life and a great name in history, Secretary Stanton communicated in confidence to an old patron his statement of the case against the General. He had not the advantage of accumulated facts nor of a retrospection extending over twenty-three years, and for these privations allowances should be made, if necessary. In that statement Mr. Stanton admits his late devotion to General McClellan and that he took office to aid him, and, proceeding to a later time, says: "Many, very many, earnest conversations I had held with General McClellan to impress him with the absolute necessity of active operations, or that the Government would fail because of foreign intervention and enormous debt." If we accept this statement as proof that such conversations were held, we are forced toward the horns of this dilemma —that General McClellan's faculties were stereotyped into a fatal immobility, or that there were military reasons for inaction which

outweighed the impending dangers of intervention and bankruptcy. The suggestion is interpolated here, that the letter to the Rev. Mr. Dyer, from which the above extract is taken, has so many inherent marks of veracity that its recent publication necessarily and justly strengthens the position heretofore taken by the adherents of Mr. Stanton without knowledge of its existence.

The Dyer letter further charges General McClellan with positive disobedience of an order of the President that the former should not undertake his self-chosen expedition to the Peninsula without making Washington absolutely secure, the specification being that he proposed to leave as a garrison less than 20,000 raw men, with not an organized brigade. The letter mentions that Generals Hitchcock, Lorenzo Thomas, Totten, Taylor, Meigs, and Ripley, all agreed that the capital was not safe. Given the fact of less than 20,000 new and unorganized troops, the expression of an opinion as to their adequacy might have been safely left to the first lance-corporal that could have been picked up and conducted to the White House. Nowadays the question may be left to General McClellan's own recent estimate of 34,000 organized and disciplined troops. It is not probable that anybody could be found to argue that Washington might have been captured or destroyed in 1862 with advantage, or, at least, without loss to the national cause. Not so thought the bankers who were to float the indispensable loans, or Secretary Seward, Ministers Adams and Dayton, or the diplomatic corps at Washington, Paris, and London.

General McClellan assumes that every adverse view and act of the President affecting himself was directly due to the influence of Mr. Stanton, yet the Dyer letter sustains other evidence that Mr. Lincoln had a good deal of initiatory power in him, and it is matter of common knowledge that, before Mr. Stanton had joined the Administration, influential members of the President's party, enjoying free access to him, were filling his ears with epithets of a particularly shameful kind, applied to a General-in-Chief who, to do him the scantiest justice, certainly loved honor, integrity, and his country.

Prudence and rationality require us, for the present, to rest the controversy between Secretary Stanton and General McClellan upon the two written memorials we have indicated, and, so resting it, the conclusion must be that General McClellan has not

proved his case and that the presumptions lie, for the time being, on the side of Mr. Stanton. If this conclusion be sound, it must be admitted that it was reasonable and proper (remembering *en passant*, that General Halleck, and not the Secretary of War, was responsible for the abandonment of the Peninsula) for Mr. Stanton to oppose, by every means in his power, the restoration of General McClellan to command, after the breakdown of General Pope, while such popular and experienced officers as Sumner, Franklin, Porter, and Burnside were available to rally and reorganize the shattered armies. All that Mr. Stanton thereafter did to remove and exclude General McClellan from command was but the natural sequel to the relations and opinions that had grown up between the once firm friends. There was no longer room for both, and, down to this present year of grace, it has not been shown that Mr. Stanton's retirement would have been the better thing for the public interest.

Secretary Stanton's connection with the dismissal of General Porter calls for no elaborate discussion. That unfortunate and meritorious officer was treated in exact conformity to the deliberate finding of a court whose members may not, in honesty, be insulted by a line of argument that stamps them as recreants or poltroons, and the reversal of that sentence has resulted from circumstances that import nothing worse than honest and apparently unavoidable error in the original judgment. Pathetic as every man of sensibility must feel General Porter's situation to have been for well-nigh a quarter of a century, it were better that this single, piercing act of injustice (involuntary injustice, seemingly, so far as the court and the reviewing authorities were concerned) should have remained forever undetected, than that reparation should appear to involve a mangling of the reputations of men equally upright and deserving as himself. General Porter and his friends have honorably refrained from such courses; it is the stupidity or malignancy of comparative strangers to his quarrel with Fate that have led to his being paraded as a victim to the satanic disposition maliciously or mistakenly ascribed to Mr. Stanton.

Mention of General Porter's case naturally suggests that of General Buell, another capable and meritorious officer, removed from a command held usefully for the country and with great promise for his own future. In this matter General Fry—ever devoted and serviceable to his fallen chief—has been likewise

faithful to the cause of truth, by enabling us to see that the removal of General Buell was virtually forced upon the Secretary by influences which the Administration was not in a position at the moment to resist, and that when, later on, Mr. Stanton was able and willing to give General Buell renewed opportunity of service and distinction, the latter prefaced his acceptance with conditions that the Secretary could not accept.

The bulletin wherein Mr. Stanton discussed the bearings of the Sherman-Johnston convention, has been made the occasion of reflections upon his character and methods, but not to an extent sufficient to warrant minute examination of the controversy in these pages. A subordinate commander, of great merit and distinguished service, with knowledge that his immediate superior had limited his own action to negotiating a surrender and parole of the enemy in his front, framed a treaty with the commander of the hostile forces opposite himself by which to regulate the future relations of the Government with the insurgent States. It was an unprecedented and unnecessary proceeding, which, for the moment, shook the loyal part of the country to its foundations and rekindled dying hopes in insurgent breasts, which could only engender disappointment and sullenness. The act was deemed well-intentioned, but a lamentable mistake, and though long since condoned, it has never received public justification. Disowned unanimously by the startled President and his Cabinet, it became Mr. Stanton's duty to communicate the action of the Government and the grounds thereof to the public, and this he did in language that took small account of General Sherman's feelings, but showed great solicitude for the wound inflicted upon republican institutions by the ill-judged conduct of an impetuous general. It might have been possible to have effected every needed purpose by gentler words, but to make such an argument is to lower a great question to a matter of taste, style, or personal feeling. Mr. Stanton lost no contemporary esteem by his bulletin, nor has any thing yet appeared to indicate that his future fame is in any degree compromised by it.

The controversy about the execution of Mrs. Surratt is one easily disposed of, so far as it concerns Mr. Stanton. Mrs. Surratt was tried and condemned by a legal tribunal upon a full hearing, and was recommended for a commutation of sentence by a majority of her judges. This recommendation found its proper place in the record, had its due consideration by the

President, and was overruled. Nearly two years afterward it was thought that Mr. Johnson's approval of the death sentence of Mrs. Surratt had somewhat impaired his availability as a Presidential candidate, and he was publicly reported to have expressed doubt that the recommendation to mercy had been brought to his attention. The officers who considered their fidelity assailed by such doubts, let it be known that the recommendation had been brought to the President's notice, whereupon the latter sent for the record, examined it, satisfied himself that he had seen the recommendation before signing the order for the execution, and thereafter left the public discussion of the matter to his political managers. The record still exists, and an inspection of it is sufficient to exonerate Mr. Stanton from aught else than expressing his official opinion that the death sentence should be executed. Those who shared that opinion with him at the time were a large and reputable multitude; hence, possible error of judgment is the severest accusation that can fairly rest upon him in this particular matter.

Obloquy has been also invoked upon the fame of Mr. Stanton, because, while a member of Mr. Buchanan's Cabinet, he held confidential relations with the chiefs of the incoming and opposite party. It is admitted that these relations resulted from and were restricted to the extraordinary and perilous situation of the national Government, and that their only object was to keep that tottering fabric upright till it could be turned over to the open and lawful custody of those who had been chosen as its future caretakers. There is not the slightest ground for suspecting that Mr. Stanton had any personal end in view; he simply sought, so far as has appeared, to preserve the rights, powers, and machinery of the Federal Government, and to transmit them in such form to the succeeding Administration as would leave it some degree of selection and initiative in further efforts for their preservation. Congress had recognized the unusual and delicate nature of the situation by raising a special committee to aid in watching over the Government until the chiefs of the dominant party could take possession. Senator Howard, of Michigan, has stated that other members of the Buchanan Cabinet beside Mr. Stanton took the same course that he did. Mr. Seward has said that Mr. Stanton had expressed to him in these confidential interviews entire faith in the loyalty of President Buchanan and his Cabinet, and we know that when the emergency was past

and the Government had been handed over to the new Cabinet, Mr. Stanton ceased his relations with its members, and was soon busy expressing utter contempt for and distrust of Messrs. Lincoln and Seward. The just conclusion, therefore, seems to be, that, in circumstances of extreme urgency, Mr. Stanton took a disagreeable and highly patriotic course, limiting his action in time and measure to the absolute necessities of the case, and winning nothing for himself except such posthumous gratitude as his rescued country may choose to bestow upon him.

The only remaining controversy worthy of notice is that with President Johnson. Of this, suffice it to say that the Secretary, always distrustful of others, doubtless believed that the President meditated turning his inflammatory and seditious language about Congress into equally violent and unlawful, and, therefore, treasonable action, and so believing, he was justified in supporting Congress by retaining his hold upon the military power of the Government. Doubtless, his belief was erroneous, and his retention of his post at the War Office unnecessary, but the wisest of us did not know the error and the superfluousness of his ways till Congress, having the country at its back, laid the President in the dust, and then it was too late to reverse his judgment or his action. For his inability to foresee what no human being could closely anticipate, Mr. Stanton suffered bitter mortification, and that should be the end of it, unless his patriotic intention is to be honored by posthumous reward in this case also.

Whenever a grievance is brought up for discussion, be it that of General McClellan, or Porter, or Buell, or Sherman, or the unfortunate woman already named, it is always Mr. Stanton, of the principal officers of government, upon whom the reviling falls, and the line of attack is either that he ignored his chief and his colleagues in the administration, or yoked them to his own malignant purpose. Each of the cases mentioned was a matter of the highest public and political importance in its own day, and the names of Lincoln, Johnson, Seward, Chase, and many others that might be mentioned in Senate, House of Representatives, and the executive and editorial chairs of the powerful States, do not suggest men that permitted themselves to be effaced or passively led. Hence, if the way taken in each and all of these cases was Mr. Stanton's way, the conclusion follows that he must have been a man of great ability, strong will, and overshad-

owing influence. In a broad and summary mode of putting the question, what use did he make of these several powers? We know that, under his management, the ranks of the army were kept full; its organization, discipline, and equipment maintained; its leaders of every grade, who showed boldness and enterprise, supported, encouraged, and rewarded; and that throughout the almost numberless ramifications of the vast administrative machine in his charge, all that tended to inefficiency or demoralization, in any form or degree, was sternly suppressed, so far as his tireless eye or hand could see or reach. We know that his example and the dread of his free-spoken censure virtually multiplied his personality in innumerable situations and circumstances. We know that he sought neither popularity nor influence; for he courted, placated, and gratified nobody, but renewed each day's life and experience with looks, attitudes, and words of scorn and defiance for all comers. None of his kindred, friends, or followers got high places or fruitful opportunity. His name is a talisman to no favors or advantages for those he loved, for he never served or enriched anybody but the Republic, and she has neither paymaster nor almoner. He entered office with a competency, a prosperous business, and good health; he left it in poverty, destitute of professional employment or connection, and with a shattered constitution. It is touching to think of this man, prostrate in health and fortune, pledging and selling the fragmentary remains of his economy in early life for bread for his family. His sorrows flowed from his patriotism, his honesty, his intensity, his singleness of purpose, and, like his deeds, they are a part of the glory of his country. No doubt, he had grave faults and serious defects of character; that he sometimes erred greatly in matters of policy and wrought injustice to individuals, but if these things are to form an impenetrable barrier against examination of motive and estimate of service and capacity, we cannot too soon, in love of consistency, hurl the towering obelisk at Washington into the Potomac, tear down the monument at Springfield, and resolve to leave forever unadorned the lonely tomb at Riverside.

The few in blood or friendship to whom the memory of the American Carnot is dear may serenely confide that memory to the care of those who are to succeed us in the keeping and advancing of this "Heaven-rescued land." Free from the personal interests and too-proximate influences that mar our perceptions

and judgments, they will be capable of a clear conception and a right valuation of that fervor of intellect, that steadfastness of will, and that concentration of spirit which were at once the incentives and guides to great actions and results. It is rash, very rash, in one who has looked upon the memorial stones of an hoary-ancient Egypt or Assyria, and sneered, in true modern fashion, at the short-lived immortality of their sculptured demigods and heroes, to venture to group for the twentieth century those that the nineteenth is pleased to number among the great and wise of the earth; but when the mind once realizes all that is implied in the simplicity, the directness, the unquestioning and uncaring devotion of this man's character in the pursuit of a single and lofty purpose, Fancy comes and sets his image not greatly apart from that of an undying hero of the Confederacy; he that might have disputed with Cromwell the command of the Ironsides, or with Moses the custody of the sacred tablets on the dreadful Mount.

Chas F. Benjamin

APPENDIX.

SECRETARY STANTON'S LETTER TO REV. HAMMOND DYER.

WASHINGTON, May 18, 1862.

MY DEAR FRIEND:—Yours of the 10th is welcome as an evidence of the continued regard of one whose esteem I have always been anxious to possess. I have been very well aware of the calumnies busily circulated against me—in New York and elsewhere—respecting my relations to General McClellan, but am compelled from public consideration to withhold the proofs that would stamp the falsehood of the accusations and the base motives of the accusers, who belong to two classes:

First—Plunderers, who have been driven from the Department when they were gorging millions.

Second—Scheming politicians, whose designs are endangered by an earnest, resolute, and unconpromising prosecution of this war, as a war against rebels and traitors.

A brief statement of facts on official record, which I can make to you confidentialy, will be sufficient to satisfy yourself that your confidence in me has not been misplaced.

First. When I entered the Cabinet I was and had been for months the sincere and devoted friend of General McClellan, and to support him and, so far as I might, aid and assist him in bringing the war to a close, was a chief inducement for me to sacrifice my personal happiness to a sense of public duty. I had studied him earnestly, with an

anxious desire to discover the military and patriotic virtue that might save the country, and if in any degree disappointed I had hoped on and waited for time to develop. I went into the Cabinet about the 20th of January. On the 27th the President made his Order No. 1, requiring the Army of the Potomac to move. It is not necessary, or perhaps proper, to state all the causes which led to that order, but it is enough to know that the Government was on the verge of bankruptcy, and at the rate of expenditure the armies must move or the Government perish. The 22d of February was the day fixed for movement, and when it arrived there was no more sign of movement on the Potomac than there had been for three months before. Many, very many, earnest conversations I had held with General McClellan to impress him with the absolute necessity of active operations or that the Government would fail, because of foreign intervention and enormous debt. Between the 22d of February and the 8th of March the President had again interfered, and a movement on Winchester and to clear the blockade of the Potomac was promised, commenced, and abandoned. The circumstances cannot yet be revealed.

On the 8th of March the President again interfered, ordered the Army of the Potomac to be organized into army corps and that operations should commence. Two lines of operation were open—one moving directly on the enemy at Manassas and forcing him back on Richmond, beating and destroying him by superior force, and all the time keeping the Capital secure by lying between it and the enemy. This was the plan favored by the President. The other plan was to transfer the troops by water to some point on the lower Chesapeake, and thence advance on Richmond. This was General McClellan's plan. The President yielded his own views, although they were supported by some of the best military men in the country—and consented that the General should pursue his own plan. But by a written order he imposed the *special condition* that the army should not be removed without leaving a sufficient force in and around Washington to make the Capital *perfectly secure* against all danger; and that the force required should be determined by the judgment of all the commanders of the army corps.

In order to enable General McClellan to devote his whole energy to the movement of his own army (which was quite enough to tax the ability of the ablest commander in the world), he was relieved from the charge of the other military departments, it being supposed that the respective commanders were competent to direct the operations in their own departments. To enable General McClellan to transport his force, every means and power of the Government were placed at his disposal, and unsparingly used. When a large part of his force had been transferred to Fortress Monroe, and the whole of it about to go in a few days, information was given to me by various persons that there was great reason to fear that no adequate force had been left to defend the Capital in case of a sudden attack; that the enemy might detach a large force and seize it at a time when it would be impossible for General McClellan to render any assistance. Serious alarm was expressed by many persons, and many warnings given me which I could not neglect. I ordered a report of the force left to defend Washington. It was reported by the commander to be less than 20,000 raw recruits, with not a single organized brigade. A dash like that made a short time before at Winchester would at any time take the Capital of the nation. The report of the force left to defend Washington, and the order of the President, were referred to Major-General Hitchcock and Adjutant-General Thomas, to report:

First—Whether the President's orders had been complied with.

Second—Whether the force left to defend the city of Washington was sufficient.

They reported in the negative on both points. The reports were submitted to the President, who also consulted General Totten, General Taylor, General Meigs, and

General Ripley. They agreed in the opinion that the Capital *was not safe*. The President then by written order directed me to *retain one of the army corps* for the defence of Washington; either Sumner's or McDowell's. As part of Sumner's corps had already embarked, I directed McDowell to remain, with his command, and the reason was approved by the President.

Down to this period there had never been a shadow of difference between McClellan and myself. It is true that I thought his plan of operations objectionable as the most expensive, the most hazardous, and most protracted that could have been chosen, but I was not a military man, and while he was in command I would not interfere with his plan, and gave him every aid to execute it. But when the case had assumed the form it had done by his disregard of the President's orders, and by leaving the Capital exposed to seizure by the enemy, I was bound to act, even if I had not been required by the specific written order of the President. Will any man question that such was my duty? When this order was communicated to General McClellan it of course provoked his wrath, and the wrath of his friends was directed upon me because I was the agent of its execution. If the force had gone forward, as he had designed, I believe that Washington would this day be in the hands of the rebels. Down to this point, moreover, there had never been the slightest difference between the President and myself. But the entreaties of General McClellan induced the President to modify his orders to the extent that Franklin's division (being part of McDowell's corps that had been retained,) was detached and sent forward by boat to McClellan. This was against my judgment, because I thought the whole force of McDowell could be kept together and sent forward by land on the shortest route to Richmond, thus aiding McClellan, and at the same time covering and protecting Washington by keeping between it and the enemy. In this opinion Major-General Hitchcock, General Meigs, and Adjutant-General Thomas agreed. But the President was so anxious that General McClellan should have no cause of complaint that he ordered the force to be sent by water, although that route was then threatened by the *Merrimac*. I yielded my opinion to the President's orders, but between him and me there has never been the slightest shadow since I entered the Cabinet, and, except the retention of the force under McDowell by the President's orders for the reason mentioned, General McClellan has never made a request or expressed a wish that has not been promptly complied with, if in the power of the Government. To me personally he has repeatedly expressed his confidence and his thanks, in the dispatches sent me.

Now one word as to political motives. What motives can I have to thwart General McClellan? I am not, never have been, and never will be a candidate for any office. I hold my present post at the request of the President, who knew me personally but to whom I had not spoken from the 4th of March, 1861, until the day he handed me my commission. I knew that every thing that I cherish and hold dear would be sacrificed by accepting the office. But I thought I might help to save the country, and for that I was willing to perish. If I wanted to be a politician or a candidate for any office, would I stand between the Treasury and the robbers who are howling around me? would I provoke and stand against the whole newspaper gang in the country, of every party, who, to sell news, would imperil a battle? I was never taken for a fool, but there could be no greater madness than for a man to encounter what I do for any thing else than motives that overleap time and look forward to eternity. I believe that God Almighty founded this Government, and for my acts in the effort to maintain it I expect to stand before Him in judgment. You will pardon this long explanation, which has been made to no one else. It is due to you, who were my friend when I was a poor boy at school and had no claim upon your confidence or kindness. It cannot be made public for obvious reasons. General McClellan is at the head of our chief

army, he must have every confidence and support, and I am willing that the whole world shall revile me rather than to diminish one grain of strength needed to conquer the rebels. In a struggle like this, justice or credit to individuals is but dust in the balance.

Desiring no office nor honor, and anxious only for the peace and quiet of my home, I suffer no inconvencience beyond that which arises from the trouble and anxiety suffered by worthy friends, like yourself, who are natually disturbed by the clamors and calumnies of those whose interest or feeling is hostile to me. The official records will at the proper time fully prove :

First—That I have employed the whole power of the Government unsparingly to support General McClellan's operations.

Second—That I have not interfered with nor thwarted them in any particular.

Third—That the force retained from his expedition was not needed and could not have been employed by him ; that it was retained by express orders of the President, upon military investigation and upon the best military advice in the country. That its retention was required to *save the Capital* from danger to which it was exposed by a disregard of the President's positive orders of the 6th of March.

Fourth—That between the President and myself there has never been the slightest shadow of difference upon any point, save the detachment of Franklin's force ; and that was a point of no significance, but in which I was sustained by Generals Hitchcock, Meigs, Thomas, and Ripley, while the President yielded only to an anxious desire to avoid complaint, declaring at the same time his belief that the force was not needed by General McClellan.

You will of course regard this explanation as being in the strictest confidence, designed only for your information upon matters wherein you have expressed concern for me. The confidence of yourself and men like you is a full equivalent for all the railing that has been, or can be expended against me ; and in the magnitude of the cause all merely individual questions are swallowed up. I shall always rejoice to hear from you, and am as ever, truly yours,

EDWIN M. STANTON.

THE APACHE PROBLEM.

By BVT. MAJOR-GENERAL GEORGE CROOK,
BRIGADIER-GENERAL, U. S. A.

ANY article which treats of the present mode of warfare of the American Indians must necessarily be incomplete without a glance backward at their history. It is important at first to show the conditions which existed at the time the first European settlers established themselves on this continent.

The Indians, who occupied the Atlantic coast of America, were all in a greater or less degree sedentary; they all lived in villages or collections of huts; all cultivated the soil and raised maize, and possibly other vegetables and were experts in the chase. The almost trackless forests which then covered the eastern slope of the Appalachian Range were their hunting-grounds. Their arms were exclusively of their own manufacture, bows and arrows, the war-club and the lance, their implements equally of warfare and the chase. As with all other peoples they have been quick to profit by such improvements in weapons of offence as have come to their notice. It is an axiom in the military science that troops with superior weapons can always overcome mere numerical superiority.

These Indians recognized at once the inferiority of their bows and arrows to the fire-arms of the European colonist and for this reason, if no other, as a rule were almost uniformly friendly in their first intercourse with the white settlers; and it was not until they became convinced that their country would soon be overrun by the new race, that they ventured, as a last resort, to engage in hostilities. These early wars were bloody, but of short duration. The ever pressing forward of the white men made it necessary that the red man should be driven back. One tribe was beaten, often annihilated, and at once their lands were taken and occupied by their victors, and again and again the opera-

tion was repeated. Each year found the frontier advanced and the Indians, or the remnant which remained, as a rule became vagabonds and lingered among the white settlers. They learned easily the vices of the white man but not his virtues.

This, in brief, is the history of the Indian race east of the Mississippi.* Their lands were arable and the constantly increasing tide of settlers occupied them with irresistible force. Several attempts were made by means of formidable confederacies to stem the tide, but though great loss was often inflicted on the colonists, the result was inevitable; civilization always conquers barbarism, and it is a sad commentary on civilization to think that a few scattered remnants are all that now remains of the Indian race who peopled the vast territory east of the Missouri two hundred and fifty years ago.

The red race, driven from the fertile forest and prairie country which until within a few years has been deemed the only region suitable for agriculture, found for many years a secure roaming place west of the Missouri. Their lands were not coveted because their capabilities for cultivation of the cereals were not understood. The forced movement westward, however, had its natural effect upon the Indians. Those dispossessed of their hunting-grounds, east of the great river, either drove the Indians to the westward still farther towards the occident, or were in the clash of tribes annihilated, or in some instances assimilated with the stronger band. The Sioux, under their various names, were unquestionably the strongest of all the tribes between the Mississippi and the Missouri; and when it became necessary for them to cross the Missouri, we find that the tribes occupying the valleys of the Platte, and of the tributary streams farther to the north, suffered from their incursions, until but fragments remain of the powerful tribes, such as the Omahas, the Poncas, the Mandans, Arickarees, etc., who had lived, perhaps, for centuries on the lands which were now needed by their enemies the Sioux. It is probable up to this time the Sioux were sedentary Indians and in common with most of the tribes east of the Missouri raised corn and some kinds of vegetables; but when dispossessed of their homes they became pure nomads and lived almost exclusively on flesh. The buffaloes which roamed in immense herds over the whole of the region they had seized, furnished them food and their skins shelter.

* The forced emigration of many of the tribes of the South Atlantic and Gulf States to the Indian Territory has not been lost sight of.

From this time forward until the discovery of gold in California, their only intercourse with the dominant race was with trappers and traders with whom they lived on friendly terms; the occasional conflicts of detached lands with trapping parties of whites were probably due more to the jealousy of rival trading companies than to any hostility of the Indians against the white intruders. Their habits of warfare continued practically the same; the treeless plains offering no inducement to settled homes; they followed the buffalo in its migration; they did not attempt to build defensive works and their war-like operations were always offensive. They depended on sudden surprises, and if their attack failed, as a rule they disappeared as rapidly as they assembled. Their weapons, though they steadily and perseveringly sought to obtain fire-arms and did obtain many though of inferior quality, mainly remained such as they could manufacture themselves. The stone or obsidian arrow-head and lance-point gave place to those made of iron; but they were still conscious of their inferiority in this respect to the white man. The rush overland to California following the discovery of gold, while it undoubtedly led to much bloodshed, did not materially change the friendly relations existing between the Indians of the Great Plains and the whites, and it was not until the tide of immigration following the building of the transcontinental railroad began to press them from their hunting-grounds, and the rapidly diminishing numbers of buffalo endangered their food supply, that they again concluded to measure their strength with the invaders. Their vast superiority in numbers for a time succeeded in setting at defiance the power of the Government, and a treaty was made with them setting aside a reservation for their use, stretching from the Missouri to the Rocky Mountains and causing the abandonment of several military posts. In the meantime the invention of breech-loading fire-arms has made a momentous change in the whole system of military operations, and while it added for a time uncalculated strength to troops, in the course of a few years to a still greater degree added to the difficulties encountered in savage warfare. The muzzle-loading fire-arms were scarcely more to be feared in the hands of Indians than the bow and arrow, since they could not be used to advantage on horseback. But when the Indians began to get the breech-loading arms and the fixed ammunition, their tactics and whole system of warfare were changed. Instead of attacks, like a whirlwind upon detached

parties, they changed their methods and in secure retreats awaited onsets. From an offensive warfare exclusively they adopted a system of offensive-defensive operations. The result was manifested in the fight on the Little Big Horn, in which General Custer was killed and the greater portion of his command of regular soldiers annihilated. The advantages resulting to the Indians of the Great Plains, from the possession of the new arms and ammunition, were lessened by the fact that they had large herds of horses which owing to the physical condition of the country could be followed and captured, leaving them on foot; and being essentially mounted Indians they were at the mercy of their pursuers when dismounted. Then too, the intense cold of northern winters compelled the Indians to go into camps for shelter, and these camps could be located and attacked by troops, as instanced by the surprise of the Piegans, in Montana, the Sioux under Crazy Horse in Dakota, and the Cheyennes under Roman Nose in Wyoming.

But though all these various conditions and the successful attacks upon them must have convinced the Indians of the ultimate superiority of the white man, there was no disposition shown to abandon the struggle, and it became apparent to thinking soldiers that other means must be sought to secure the pacification of the formidable tribes, such as the Sioux, Cheyennes, and Arrapahoes. This end was attained by enlisting Indians as soldiers, or rather to be more precise, as scouts. Large numbers were armed and organized under intelligent, active, and brave officers. The Indians finding that their own people were being used against them, gave up the fight, as they knew that the result was inevitable; and to-day the whole of those powerful tribes are quiet and will probably so remain unless driven again upon the war-path by the greed of the white man. The danger from this source may be instanced, from the threatening demeanor of the Cheyennes and Arrapahoes during the past summer, the outbreak of which tribes was probably prevented by the wise and skilful adjustment of their grievances.

The mode of warfare, of the Indians occupying the western slope of the Rocky Mountains, is in many respects as dissimilar from that of their brothers living on the Plains to the east of the continental divide as in the physical character of the country in which they live. In a paper of this nature it is hardly necessary to consider the fish-eating Indians of the Columbia, as their

numbers and present condition practically preclude the possibility of their ever becoming a source of trouble to the Government, so far as warlike operation are concerned; and the limits of this article will not admit even a passing reference to the Bannocks, Shoshones, and their southern cousins, the Utes; the more especially as the prominent characteristics of the Mountain Indians, as compared with the Indians of the Plains, are exhibited in a greater degree in the Apaches, who are to-day the representative Indians of America, so far as ferocity, courage, cunning, and skill in savage warfare are concerned.

The country these Indians occupy and which in event of hostilities is subject to their raids, consists of the territories of Arizona, and New Mexico, Northwestern Texas, and the states of Chihuahua, and Sonora in Mexico. At times their raids have been extended to the states of Durango, and Sinoloa, and as far to the west as the Pacific Ocean.

It is the roughest portion of the continent, and it is impossible for persons not acquainted with it from personal inspection to form any correct idea of its rugged mountains and arid plains. The character of these Indians is such as might be expected under such surroundings. The constant struggle with adverse conditions, with hunger, with exposure to extremes of heat and cold, and to danger of every kind kills in infancy the weak and sickly children; only the strong, perfectly developed child survives. Consequently the adult Apache is an embodiment of physical endurance—lean, well proportioned, medium sized, with sinews like steel, insensible to hunger, fatigue, or physical pains, the Apache warrior resembles as little the well-fed Indian of the eastern reservations, as does the hungry wolf the sleek house-dog.

Greatly as the invention of breech-loading arms and fixed ammunition has changed the nature of war with all Indian tribes, with the Apaches it has added to the difficulties to be contended against and overcome to an almost incredible extent. Each individual represents, in his own personality, the effect of generations of warfare and blood-shed. His own nature differs but little from the wolf or coyote, and from his earliest infancy he has been accustomed to defend himself against enemies as cruel and revengeful as his own nature. They are no longer our inferiors in equipment. Their weapons of even ten years ago have given place to the best arms of the best makers. Like the coyote

he is perfectly at home, anywhere in the immense country over which he roams and which affords him all the sustenance he requires. Even in his rapid flights he gets a rabbit here or a rat there, and this, with the wild roots and the mescal, gives him all the food he needs. It is, therefore, unnecessary for him to carry provisions. They have no property which they cannot carry on their backs in their most rapid marches; nor have they, when on the war-path, any settled habitations of any kind, and their temporary resting-places are chosen with the instinct resulting from the experience of generations.

The Apache can endure fatigue and fasting and can live without water for periods that would kill the hardiest mountaineer. Every thing he has ever received from the white man is a luxury which he can do without as he has done from time immemorial.

From these preliminaries an idea can be formed of the labors and dangers to be encountered in fighting the Apaches, and yet it is only by actual experience that these difficulties can be appreciated. In fighting them we must of necessity be the pursuers, and unless we can surprise them by sudden and unexpected attack, the advantage is all in their favor. In Indian combats it must be remembered that you rarely see an Indian; you see the puff of smoke and hear the whiz of his bullets, but the Indian is thoroughly hidden in the rocks and even his exact hiding-place can only be conjectured. The soldier on the contrary must expose himself, and exposure is fatal. A dozen Indians in the rocks can withstand the onset of a battalion of soldiers, and though they can be driven from their position at the cost of many lives in the attacking party, it only results in their attaining another position equally as strong as the first, or in their scattering like quail in the rocks, to appear at some point miles away, in front, on either flank, or in rear, as may seem to them desirable. The Apaches only fight with regular soldiers when they choose and when the advantages are all on their side. If pursued to their rocky strongholds, they send their families to some other point beyond immediate reach of danger, while the bucks absolutely without impedimenta swarm your column, avoid, or attack, as their interests dictate, dispute every foot of your advance, harass your rear and surround you on all sides. Under such conditions regular troops are as helpless as a whale attacked by a school of sword-fish. The tendency of military drill and discipline is to make the individual soldier a machine, dependent upon the

officer in command for its movement and action, and upon cohesion with its fellow machines for its efficiency. His individuality is completely lost in his organization and he therefore cannot compete on equal terms with an enemy whose individuality under all circumstances is perfect. In operating against them the only hope of success lies in using their own methods, and with the above facts in view, it must be evident that to successfully operate against them a partial tribal disintegration must take place, and that a portion of the tribe must be arrayed against the other. Acting upon this principle was due the success attending operations against them in 1872 and 1873, which resulted in placing over 5,000 of them on the White Mountain Reservation. The application of the same methods settled the Sioux troubles in 1876–77.

In this connection it may not be amiss to describe the measures which I first employed in making this valuable auxiliary force useful in Indian campaigns. The first difficulty was in overcoming the prejudices of army officers to commands of this character and securing men properly qualified for such duty. The officers secured, I selected Indians for enlistment. There are negative characters among Indians as among white men, and the nearer an Indian approaches to the savage state the more likely he will prove valuable as a soldier. I therefore selected, preferably, the wildest that I could get. They were organized in companies of convenient size. To give the scouts confidence positive orders were given that they should only be used to discover the locations of the hostile rancherias, and when discovered, such dispositions should be made that under no circumstances should any of the scouts be injured in the fight. Within a short period the scouts became so encouraged that their efficiency was greatly improved and at times they suffered severe loss without demoralization. In organizing Indian scouts too much attention cannot be given to the selection of the officers who are to command. The American Indian cares very little about our idea of rank. Efficiency, and efficiency only, is what he looks for in the man who is to lead him on the war-path. Their leaders necessarily have to be of the best physique, in robust health, capable of enduring great fatigue, of undisputed courage, of great patience, good judgment and discretion. The commanders of Indian scouts have therefore, as a rule, been selected from the younger officers, whose health is still unimpaired and whose ambition is

a guiding motive, rather than from officers of more experience, upon whose vigor and energy the effects of long service have began to tell. The scouts are not mounted. The Apache is a foot Indian, capable of making from forty to sixty miles a day in this rough mountainous country. Horses would be useless, as it would be impossible to keep them in remounts on such service. Supplies cannot be carried, except by pack-trains. The organization and management of these is a matter to which too much care and thought cannot be given.

No opinion can be more fallacious or dangerous than the idea which seemed to have obtained with some officers, that the pack-train is merely a secondary consideration, a something which can be beaten and hammered along the trail "by the labor troops." An efficient pack-train is, next to Indian scouts, an important adjunct in this warfare. To detail soldiers to manage it entails upon them extra labor of the severest kind, and duties of which some of them at least must be ignorant; and as a consequence the animals suffer, and become sore and worn out. An experience of more than thirty years convinces me that a pack-train can only be efficient when composed of mules expressly selected and used solely for that purpose.

The packers should be civilians, hired and paid liberally as such.

In further explanation of the method of Apache warfare, I cannot do better than refer to an incident of the present operations against the Chiricahua Apaches.

Early in November, a party of eleven hostile Chiricahuas crossed the border and went up into New Mexico. At that time every point along the line which afforded sufficient water for a troop of cavalry, was guarded, and the country between was constantly patrolled. The Chiricahuas finding that their water-holes were guarded changed their usual tactics, and avoiding them, made their passage in the most difficult points of the mountains. They are not dependent upon the water-holes for waters, but can go one hundred miles without halting, carrying such water as they need for themselves in the entrails of cattle or horses killed by the way, and abandoning the animals they ride when these drop exhausted by thirst or fatigue.

The soldiers in pursuit have each but one horse. When any of their horses or pack-mules gives out from any cause, the command is not only weakened by such loss, but extra work is im-

posed upon the poor beasts which are still able to stagger on their feet.

The Chiricahuas secured a remount at ranches on their route, and at the end of a march, of one hundred miles, were possibly in possession of fresher and better animals than when they started.

They push across the valleys by night and remain hidden by day in the rocky places and high points of the mountains, from which they can watch the surrounding country, note the approach of pursuers and lie in ambush for them, or scatter like coyotes to come together again at a place known only to themselves. No human wisdom or foresight can predict exactly where that is to be; it may be in the original direction of their line of march, on one or both flanks, or they may whip around and appear far in the rear of their pursuers.

To follow them, only one thing can be done,—the trail must be stuck to and never lost, if possible. The Apaches may retard pursuit or baffle it completely in either one of the ways indicated; and it has happened during the present campaign that our faithful Apache scouts have slowly and patiently led the troops for twenty miles over rocky stretches, where a white man could not detect the faintest indication of a trail, until, upon reaching more favorable ground, the unerring sagacity of the scouts was attested.

The country contains many rough places where a dozen men, armed, as the Chiricahuas are, with breech-loading guns, could hold a brigade in check.

In approaching these the commander of a detachment of troops has to choose between taking the precautions necessary to guard against the surprise and probable destruction of his men, which will make his own progress slow and give the hostiles so much greater advantage in time and distance, or he must assume the risk with all its consequences. When night comes, the command must halt and wait for the coming of dawn to enable it to resume the pursuit; in the meantime the raiders have put miles between them and the soldiers. This was the state of the case with the band of raiders here spoken of, as explained above. They succeeded in eluding our troops and passing the line; but word of their in-coming was telegraphed to all points, and detachments were pushed out to intercept or to follow them. Troops in front were placed in ambush at every available point which it was thought possibly might be in the

line of route. Every conceivable effort was made and artifice employed which an experience of a generation of Indian wars could suggest. They were very closely pursued, but having no impedimenta of any kind, they dashed through comparatively well-settled districts, murdering and plundering with grim impartiality citizens, soldiers, and friendly Indians. Their very feebleness of number made them all the more dangerous, as it rendered it so much the more difficult for people to know they were in any particular vicinity, until they had surrounded a ranch or ambushed some unwary traveller. The pursuit was never relaxed, and at all times parties were on the trail or moving to intercept them. But, although the party was so closely followed that twice they were compelled to abandon their horses and plunder and take to the rocks on foot, and in their next flight left no more trail than so many birds, they finally crossed back into Mexico with no loss that can be positively stated beyond one of their number killed by the friendly Apaches near Fort Apache.

For months the statement has been industriously disseminated by interested parties that the Apache scouts were untrustworthy, that they had mutinied, and every thing of that kind. But in none of these reports is there a spark of truth. The Apache scouts, for this class of warfare, are as worthy of trust as any soldiers in the world, and in all the experience I have had with them they have proved themselves energetic, reliable, truthful, and honest.

It has now, no doubt, been made sufficiently clear how and why the savages of the rocky, barren mountains of the Pacific-coast region have been such a thorn in the side of civilization; that while their fellows of the Atlantic coast and Missouri valley were no doubt vastly richer, yet these very riches placed them at a disadvantage, as they had to move slowly to protect their herds, which always left great trails, easily followed; and in winter their camp had to have some permanency to keep horses and families from freezing to death, and were, therefore, located on the bank of some stream which would afford shelter and food for their animals.

The Apache has had the climate even in his favor, and has never been obliged to go into camp on account of the severity of the seasons. He has absolutely no impedimenta of any kind, having no baggage that he cannot pack about on his back, and no horses so dear to him that he would not rather eat them than

not; no enemy so alert that signal smokes will not announce his coming the moment he approaches the mountains. After that the Apaches fight or not, as they please; but if they fight, it is always on ground of their own choosing and with every point in their favor.

Such were the Apaches, and such the condition of their country when first I assumed command of Arizona in 1871. With many misgivings I set about the attempt of reducing them to peace and quiet. At first the task seemed hopeless. The Apaches were cut up in small bands, each independent of its neighbors, and united only in the slender bonds of language, and of hatred and contempt of the whites.

It was necessary for me to go from band to band, from man to man, in the hope of being able to distinguish the good from the bad, the reclaimable from the depraved and treacherous.

I saw that the key-note of the problem lay in my success or failure to win to my side the boldest, most daring, most savage of all the young chiefs. These men are the high-mettled horses of the herd, the born leaders who, if once curbed and broken, help in the management of the negative spirits in all communities.

The Apaches had such a deep-seated distrust of all Americans that four points of policy at once obtruded themselves. First, to make them no promises that could not be fulfilled. Second, to tell them the exact truth at all times. Third, to keep them at labor and to find remuneration for that labor. Fourth, to be patient, to be just, and to fear not. The greatest of these was the question of compensated labor. No sermon on the dignity of labor could prove so eloquent an appeal to the dormant better-nature of the Apaches as the disclosure of the fact that one hundred pounds of hay was worth one dollar at the quartermaster's corral. To show him that the labor of his squaws and children was worth money was soon followed by the teaching that more money could be made if he added his labor to theirs. At large posts like Camp Apache there is a steady demand for every pound of hay the Apaches can put in; but there is also a cry for fuel for the troops and grain for the horses. We are taking the Apache by the hand and quietly teaching him the use of the axe and the plow. He is receiving his first money earned by the honest sweat of his brow. What shall he do with it? "Put it into cattle; they graze on your hill-sides and grow in value while you sleep."

The Apache is becoming a property-owner. It is property won by his own toil, and he thrills at once with the pride of acquisition and the anxiety of possession. He is changing both inside and out: exteriorly, he is dressed in the white man's garb, wholly or in part; he has n't so much time for gaudy ornamentation, and indulges less in beads, feathers, and paint. Mentally he is counting the probable value of his steers and interested in knowing how much of his corn crop the quartermaster may want next month.

He is receiving his education. Education is progress. Progress and vagabondage cannot exist in the same village. The Apache who owns ten or a dozen cows becomes a man of power; his opinions are heard with respect and his decisions sought in the disputes of his neighbors. He sees that he has gained an influence greater than that of warriors or medicine men and it is gratifying to know that his prosperity instead of exciting envy has encouraged emulation. In this sketch I have tried to make clear the guiding principles by which the Apaches have been pursued in war and handled in peace; in both I can truthfully claim some experience, and with equal truth I can assert that the greed and rapacity of the vultures who fatten on Indian wars have been a greater obstruction in the path of civilization than the ferocity of the wildest savages who have fought them.

Man is at all times the creature of his surroundings. Place him in the cultivated circles of the older States, no matter what may be his color or race, his nature becomes softened and refined, the angles are rounded, his manner and language become gentle and polished. Place him on the desert or on the mountain-top, force him to struggle with the elements, to contend for existence with the wild animals which surround him—and he degenerates rapidly into an equality with these animals. Like them he develops keenness of vision, sharpness of hearing, stealthiness of tread. He learns to bear without complaint hunger, thirst, fatigue. Excessive heat is familiar to him, and extorts no more complaint than does the excessive cold which follows it. To cross over steep, rocky mountains,—to swim swift rivers, are incidents merely in a career which is a never-ceasing struggle for the preservation of the dubious boon of life. It is in such a struggle that we should look for the survival of the fittest, and it is in just such a struggle we find it;—acuteness of sense, perfect physical condition, absolute knowledge of locality,

almost absolute ability to preserve oneself from danger, let it come from what source it may.

We have before us the tiger of the human species.

To no tribe in America can these remarks apply with more force than to the Apaches of Arizona. To see them, as they first appeared to the white men,—half clad, half fed, covered with vermin, with no semblance of property beyond the rude arms with which they doggedly waged war against unpitying nature, it was easy to believe, and many Americans did believe, that nothing could be more easily affected than their extermination or subjection. It has taken the expenditure of countless treasure and blood to demonstrate that these naked Indians were the most thoroughly individualized soldiers on the globe; that each was an army in himself, waiting for orders from no superiors—thoroughly confident in his own judgment, and never at a loss to know when to attack or when to retreat.

The Apache can be compared most aptly to the wild animal he fittingly calls his cousin—the coyote. The civilized settlements are his sheep-folds, and even supposing that a toilsome campaign results in destroying forty out of a band of fifty, the survivors are as much to be dreaded as ever, until the very last one can be run down, killed, or got under control, and taught to labor for his bread.

In one brief sentence I may embody the idea that man is more or less savage according to the certainty with which his food may be obtained, and that, all things being equal, the difficulty of subjecting any given race or people will be in the inverse ratio of its food supply. Those tribes which have the largest accumulations of food and clothing will in nearly every case fight desperately for the preservation of their villages; but these villages once destroyed their power is broken and they soon sue for peace.

But where man raises no harvests, dries no fish, preserves no meat, lives simply from hand to mouth, the trouble in effecting his capture becomes immeasurably greater, and after he has been provided with improved breech-loaders he is transformed into a foe of the most dangerous character within human knowledge.

George Crook
U.S.A.

A NEW STUDY ON THE EMPLOYMENT OF ARTILLERY IN PLANNED OFFENSIVE BATTLES.*

Translated from the German.

By FIRST-LIEUTENANT JOHN P. WISSER,
First Artillery.

INTRODUCTION.

In mathematics, by substituting special values in infinite series, representing general laws, we often obtain simple special equations. But the inverse is not always true; a general law cannot, as a rule, be derived from a special case. Similarly, in tactics, in the relation of battles to engagements of detachments.

By placing a number of detachment engagements side by side, we cannot build up the planned battle. But from the lessons taught by the planned battle, those regarding detachment engagements may be deduced; it is only necessary to substitute the proper relations of space and time in the latter. The investigation of the relations of the various parts of the battle is therefore useful in the study of division and detachment engagements.

Seven years ago the author published in his "Tactics of Field Artillery," views on the use of artillery in the planned offensive battles. Since then domestic and foreign literature has produced many different views on the use of artillery in offensive battles. The object of this lecture is to elucidate the most important of these views and at the same time to make additions to the work above referred to.

The positive propositions set forth in the lecture are not in-

*A lecture delivered to the Military Society at Posen, February 11, 1882, by Hoffbauer, Lieutenant-Colonel and Commandant of the Posen, Field Artillery Regiment, No. 20, Berlin, 1882.

tended to be complete and exhaustive; they are simply intended to serve to whet the intellect in the solution of a very important problem. They are founded on the "Tactics" of the Prussian field artillery.*

I.—OPENING OF THE BATTLE.

If the cavalry divisions marching in front of an army, with the aid of its artillery, cannot alone discover the plans of the enemy, the task of making forced reconnoissances devolves upon the advance guards. The enemy must be compelled to exhibit the development of his position, to serve as a basis for the dispositions and orders for attack.

On the following point there is no longer any difference of opinion, viz.: that the advanced bodies covering the enemy are to be rapidly and energetically thrown back, and that the artillery of the advance guard is to take direct part therein by its most effective fire, at close range.

Before the supposed principal position of the enemy, the dispositions are different. As a rule, the advance guards are to select such positions as will cover the advance of the troops in rear, and are adapted for the deliverance of a *continuous* battle; for that will be the next point for consideration. This battle is conducted principally by the artillery at long ranges of over 2,000 metres (5th Corps at Wörth, 8th Corps at Gravelotte). If this determines the enemy to show the extent of his front, as at Wörth, and the cavalry succeeds in determining the depth of the line on the flanks, one of the main objects of the preliminary battle is attained. It must be noted, however, that the enemy must have shown his *infantry*, since, by pushing forward the greater part of his artillery under cover of his cavalry divisions, he may easily deceive us, and may lead us into erroneous measures, as *e. g.*, a premature advance in the wrong direction.

In case, however, these measures do not succeed in developing the enemy sufficiently, it has been proposed, among others by the Russians,† *to develop a larger mass of artillery at greater ranges as if for the main battle.* Such a movement may, under certain circumstances, disguise its true object, but *does not in*

* They are also in accord with the alterations in § 195 of the "Tactics," which appeared after the lecture was written (Royal Cabinet Order, March 16, 1882).

† "Outline of an Instruction for the Action of the Russian Field Artillery in Battle, in Combination with the Other Arms," by Major Krahmer, *Mil. Wochenblatt*, 1885, No. 10.

itself constitute a compulsory motive for the opponent to show more than he has shown, and therefore may still withhold his infantry.

As a *last resort* of a forced reconnoissance there remains only the advance of infantry detachments of the advance guard, and above all also the artillery (compare figure 1). It is recommended, however, to first strengthen the artillery of the advance guard in proportion. The eçhelonned positions of the artillery on the flanks permit the batteries nearest the infantry to advance with it, while the retired eçhelons cover the general advance on the flanks, and finally take up position there when the battle is broken off.

A tumultuous repulse of weak advance guards, or even of large masses of artillery at close range, throwing them back upon the enemy (artillery of the 9th Army Corps at Gravelotte), leads to an exhibition of strength disproportionate to the object in view, and presents the commander-in-chief the alternative to sacrifice either the leading subdivisions or his plan of battle. In the latter case, in place of a regularly planned battle, the improvised battle, with all its disadvantages, steps in.

II.—THE PRINCIPAL ARTILLERY COMBAT.

Based on the past battles, it may be conceded that the enemy will accept the decisive battle in a position favorable as well to the defensive proper as to offensive movement, with broad front at least on one wing (French position at Gravelotte).

With respect to the main artillery combat now first possible, the various views expressed agree on the following points:

1. In this period of the combat the artillery is the principal arm. It is at liberty to select the position best suited to the ground, *if possible*, however, only in the radius of the respective corps; the other arms conform to it.
2. Pushing forward at the beginning large masses of artillery, the fire of which is directed by the higher artillery commanders.
3. Carrying on this combat, if possible, while the army moves up into position.
4. Conducting the combat, when possible, at mean ranges below 2,000 metres.

Very often the relations are so pressing that the principal artillery combat *must* be ended as soon as the army has completed its time-robbing march into position (Gravelotte). A reliable calculation of the time required for this combat is not possible. It is better, therefore, to silence the enemy's artillery too *soon*, and then prevent its revival by slow fire till just before

FIG. 1.

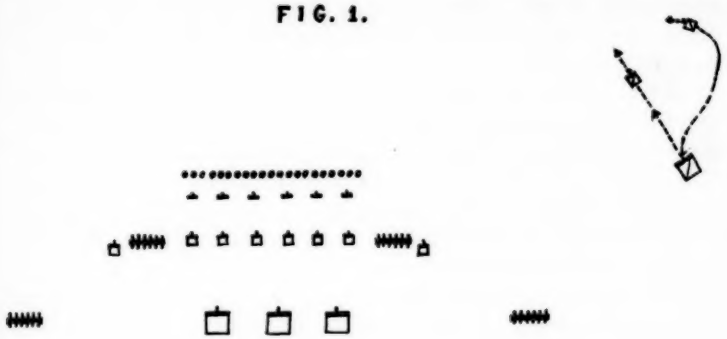


FIG. 2.

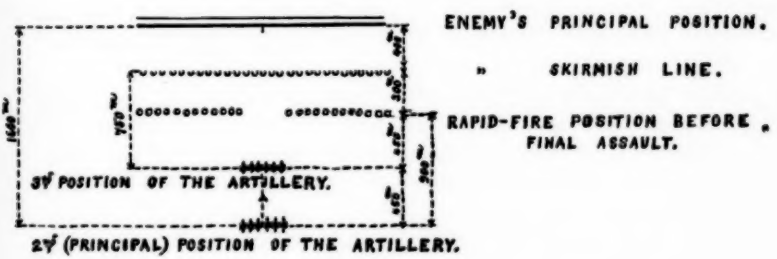
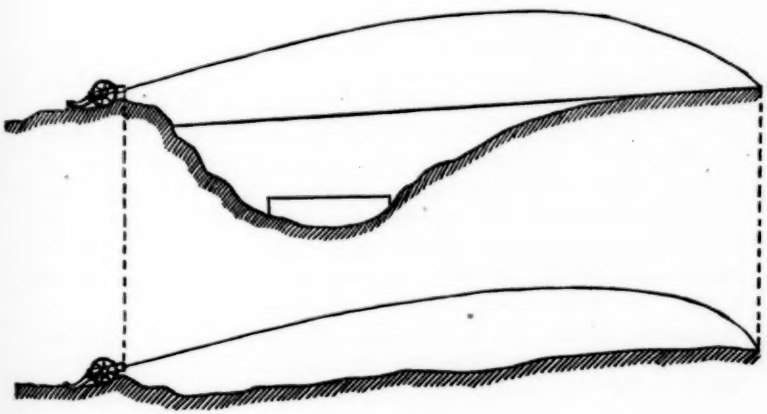


FIG. 3.



the charge begins, than too *late*, and then be compelled to come at the last moment to a rapid fire, perhaps not well concentrated!

As the shortest range for this combat, the Russians assume 700 s. = 1,400 m.; the French, 1,500 m. The consideration that, according to our "Infantry Target Practice," batteries may be fired upon with effect by infantry subdivisions up to 1,200 m., indicates that, as a rule, 1,300 m. may be regarded as a fixed limit. Our "Artillery Tactics," which gives no limits, does not conflict with this conclusion.

The French, as well as the Russians, lay down the maxim that previous to taking up this principal position the artillery should be first massed at a position, in a certain degree provisional, at greater range—up to 2,500 m. or 1,200 s. (= 2,400 m.). Their object is to tempt the enemy's artillery on the entire front to advance farther to the front. Our "Tactics" is silent on this subject.

Undoubtedly such a provisional position at greater range may become necessary. The enemy may perhaps have developed his artillery and commands the entire ground with its fire so effectively, that it must be occupied along the entire line before it is possible to advance in eçhelon to the decisive position. Sometimes it is necessary to retire advanced posts which have been pushed forward, before the artillery can occupy at medium range a position in front of the enemy (St. Maria-aux-Chênes). Often the preliminary formation of artillery retired in eçhelon on one flank is the necessary result of the successive arrival of the corps on the line of battle (battle of Gravelotte).

The object to develop more completely the enemy's artillery positions, with which the Russians follow up the artillery combat at long range, is also the reason why they do not at once develop their entire artillery, but hold in reserve "division reserves," "special corps reserves," and also a "general reserve" (for the army). Only when the artillery is pushed to the decisive positions (to 700 to 800 s. = 1,400 to 1,600 m.) the division and corps reserves strengthen the line of battle of the batteries in action. Later still the general artillery reserve is to take part in the action: when the enemy's artillery fire begins to grow weaker, when the position of the enemy becomes more accurately known from the nearer positions, and when the point for the decisive attack is decided upon. It is then advanced towards the main

point of attack up to 700 to 900 s. (1,400 to 1,800 m.), and, if possible, still nearer.

An interesting lecture on "The Battle," delivered in one of our large garrisons in November, 1881, by one of our superior officers, agrees in many respects with the Russian views on the use of artillery. The author recommends the re-introduction of a special army reserve of some eight batteries.

The experience of our army in the war of 1866 is decidedly opposed to such a permanent army artillery reserve, which conclusion was not shaken by the war of 1870–71. The corps artillery, or other subdivisions of a corps, constituting the general reserve, evidently serve the same purpose.

That *this* army artillery reserve should take part *at the beginning* in the principal artillery combat is not always possible. Not rarely the corps designated as general reserve are still on the march at the beginning of the battle (battle of Gravelotte). Nor is the case excluded, which the Russians assume as general, that at the end of the preliminary period there is as yet no certainty as to the principal point of attack. But one point must be attained: the bringing into action of the artillery of the reserve corps also in the decisive artillery combat, directed against the principal point of attack, before the charge of the infantry (Artillery of the 10th Army Corps at St. Privat-la-Montagne).

III.—SEIZURE AND OCCUPATION OF THE FOREGROUND OF THE ENEMY'S PRINCIPAL POSITION.

The necessity of advancing infantry subdivisions, before and during the principal artillery combat, so far that the artillery of the attacking force is protected against infantry fire or against offensive movements of the enemy, is generally acknowledged. The French * go so far as to move the artillery up to mean ranges only when their infantry has approached to within 400–500 m. of the enemy's position.

Colonel von Scherff holds that the infantry subdivisions should be pushed forward in front of the artillery before the infantry charge, even during the principal artillery combat, in order, after its conclusion, to act conjointly with the artillery against the enemy's artillery.

The "Tactics" of Major Meckel † goes still farther. It recom-

* "French Tactics."

† "Tactics," by J. Meckel, Major in the General Staff, 1881.

mends the seizure of the foreground by infantry subdivisions and the permanent occupation of the position. The views developed by Meckel coincide in many respects with those of the author of the present lecture, which will be outlined here.

The partial seizure of the foreground is *begun* naturally by the infantry of the advance guard during the opening of the battle and the principal artillery combat. It must be *completed*, however, before the principal decisive attack of the infantry begins. It is evident, therefore, that along the *entire* front of the enemy's position self-sustaining infantry detachments should have taken up a permanent position at such a short distance that their skirmishers can carry on a *continuous* musketry fire against the front infantry line of the enemy at some 500–600 m. By this means the following advantages are obtained:

1. The result is the capture at the proper time of such points in front of the principal position as might later on delay the principal, decisive attack of the infantry.
2. The advance at the proper time of the artillery which is to accompany the principal attack is rendered possible.
3. The timely irruption into the principal position of the last decisive infantry attack is thereby better secured. Moreover, just the least practicable declivities, which delay the movement, on account of the dead angle, which occurs in their front, are particularly favorable for occupation by the *larger* detachments. They join at the moment of the charge in the principal attack of the infantry, which has left intervals necessary for that purpose. The same holds true for small detached woods, which approach the principal position of the enemy. (Bois de la Cusse.)
4. The enemy is retained more effectually in his front. He remains longer in uncertainty as to our principal attack. In the battle of Gravelotte the seizure of St. Hubert and the occupation of the bois de Vaux and Genivaux, by large infantry detachments, held the French Guard Corps behind the enemy's left wing, that is, in front of the German *auxiliary* attack.
5. By pushing these detachments forward along the *entire* line the commander-in-chief secures the liberty, in localities not thoroughly reconnoitred, to delay the selection of the main point of attack.

As regards the conduct of the detachments the following remarks are to be noted:

The best use of the ground must be made for advance under cover. Neither roundabout ways nor the crossing of the lines of fire of the artillery must be allowed to interfere, if only it can take place at such a distance from the guns that their fire is not interfered with. In case it is necessary to expel the enemy from villages, the secure advance of the artillery must be awaited. Considerable separations of the detachments by intermediate un-

occupied ground are undoubtedly permissible, provided it is effectively commanded by the fire of the attacking artillery. The detachments must, before the beginning of the decisive attack, *take care* not to advance *farther* than will permit the front line of skirmishers, lying down or standing under cover, to carry on a continuous fire with the front line of skirmishers of the enemy's principal position. The forward movement must *not be carried too far at the beginning*. The possibility of afterwards approaching nearer is the less dangerous the farther the principal artillery combat against the enemy's artillery has advanced, the better our artillery can support the movement, the nearer the march of the column into position is to completion, and the greater the detachments are which can find covered positions in front.

The later the enemy's attack in force is delayed the more probable will it become that he will be compelled to fight in a position other than his principal position, exactly the result desired by the attacking party.

The strength of the detachments employed must be regulated according to the concrete relations of the position, such as the extent of cover, etc. It is of importance to so organize the detachments that they may later join organically in the general attack of the infantry.

In turning attacks it is to be recommended that in the posting of these detachments in the enemy's front their appearance on the flank be prevented.

On the battle-field of Gravelotte the line up to which such infantry detachments of the Germans, even before the beginning of the principal attack of the infantry, might have advanced, may be drawn through the northern edge of the bois de Vaux; the upper left border of the valley of the Maucebrook and St. Hubert; the clumps of woods of the bois de Genivaux, lying immediately east of the Mauce; the farm-yards of Chautrenne, l'Euvie, Champenois with the dead angles to the east formed by the declivity there; the bois de la Cusse; the dead angles on both sides of the railroad not far from the keeper's lodge; the dead angle formed by the bluff of the crest of the hills, running in a southwesterly direction from St. Privat-la-Montagne; finally, the ravines and the dead angles, approaching from the west quite close to the heights on which St. Privat-la-Montagne and Roncourt are situated.

IV.—DECISIVE PRINCIPAL ATTACK OF THE INFANTRY (CHARGE).

In case the enemy is surrounded and compelled to adopt a circular formation, as at Sedan, the artillery can decide the battle without an infantry charge.

In cases in which the original offensive movement of the enemy on ground unfavorable for him is interrupted, or in which the attack was checked mid-way, on account of weakness or for other reasons in a provisional disadvantageous position, etc., in such cases masses of artillery of the now attacking party, from commanding positions, may directly annihilate considerable portions of the enemy's front, and thereby alone decide the battle in this part of the field (The masses of artillery of General Sénarmont in the battle of Friedland, 1807; of General Drouot in the battle of Wachau, on the 16th of October, 1813; and of the German centre and left wing on the second day of the battle of Noisseville). In such cases the taking part by masses of artillery in the decisive last attack of infantry is undoubtedly fully justifiable.

Quite different are the circumstances, however, when acting against good positions on heights, in which the defender will certainly endeavor to deliver the regular decisive battle. In the last campaign, 1870–71, for instance, the attacking artillery succeeded in completely dispersing the enemy's weaker artillery only, and were generally unable to sufficiently shatter the enemy's infantry, inasmuch as it was under cover (2d and 3d Corps in the battle of Gravelotte). In *these* cases the infantry is undoubtedly the principal arm, which must finally decide the action. The interruption of the principal attack of the infantry at the *last* moment of the charge by masses of artillery becomes impracticable; the enemy will probably occupy the opposed portions of the front with weak subdivisions of infantry only, and will be enabled to take away all the other troops, to oppose them at other points of the position to the columns of attack—*e. g.*, towards the flanks, in case they are threatened.

The artillery must therefore direct itself in a much greater degree according to the main attack of the infantry. This can only take place in a manner conformable to the object in view, when the character of its action is fully known. The *decisive principal attack of the infantry* differs very materially from the combats of the advanced infantry detachments, which are to take possession of the foreground. The following is an outline

of its principal features, so far as they serve as a basis for the employment of the artillery in this period of the battle:

1. Deep attacking ranks; as a rule, three ranks.
2. Strict preservation of the contact of the subdivisions up to brigades; order and strict discipline as on the drill ground.
3. In the course of the attack, as a rule the reännexation of the advanced detachments, if possible, to their original subdivisions and their coöperation in the attack.
4. So regulating the attack that the front and flank attacks on the enemy are *simultaneous* and *at the last moment in unbroken line.*
5. Avoiding the crowding of troops where the lines attacking in front and flank meet.
6. Everywhere bearing in mind the shortest direction for the attack *without* regard to cover.
7. Steady, uninterrupted advance, without excluding the successive advance and halting of skirmishers and the halt at the last decisive rapid-firing position shortly before the charge.
8. The taking of protective measures against a possible offensive charge against the outflanking wing by means of subdivisions in rear moving towards the flank and rear; against the inner wing of the line of principal attack by means of the troops which conduct the auxiliary attack.
9. A fixed development of the front of the principal attack,—some 2,400 to 3,600 paces when directed against a wing, 3,800 to 5,000 paces when directed against the centre of the position.

The determination of this development of front is based upon an old maxim of Napoleon's, according to which an army corps, holding a position, is placed in a disadvantageous position, when at least one quarter of its infantry—*i. e.*, one brigade, hence about 1,000 paces of its front has been annihilated. This gap can only be filled or prevented by *reserves*, if they succeed in arriving in time, which is not always the case (French Guard Corps at Gravelotte), or by *troops from adjacent portions of the line*, against which the main attack is not directed. What must be the extent of the main attacking-line, in order that a timely coöperation of these troops at the point penetrated may be prevented?

So long as the columns of attack remain behind the principal artillery position they are not usually visible to the enemy, only when they appear on the heights—*i. e.*, at 1,300–2,000 m. can he detect with certainty the direction of our principal attack. Only such infantry subdivisions of the position, which are at most at this distance from the proposed point of attack and which set out *at once*, can arrive in time to prevent the break in the line. From which it follows that this portion of the position must also be included in the main attack. If we consider that the enemy

must lose several minutes in issuing his orders and assume that such reinforcements can only be drawn from one side, as in the attack of a wing, we obtain about 2,400 to 3,600 paces as the extent of front necessary for the main attack of the infantry. It is increased to 3,800 to 5,000 paces when the main attack is directed more towards the centre of the enemy's front, because the enemy's reinforcements may then be drawn from both sides. The first development corresponds to from 3–4, the second to from 4–5 infantry brigades to a front, formed side by side in three ranks. We assume the *greater* measure and thus arrive at one army corps for the main attack of the infantry against a flank of the enemy, provided that general reserves are at hand. For a front attack for the purpose of effecting a central breach an army corps appears insufficient. The army corps is with us the largest unit of battle, with which a united and simultaneous charge is possible.

Let us return to the use of artillery. It is universally acknowledged that *the infantry alone is not intended to carry the battle to a victorious issue* (storming of St. Privat-la-Montagne); *it must be energetically supported by the artillery.* Two means exist for accomplishing this purpose:

1. The firing of the artillery over the advancing infantry from its recent or from a somewhat more advanced position (at mean range).
2. The advance of the artillery with the infantry, in order to support the decisive infantry attack at close range.

In regard to the *extent to which these two means should be applied* various views are held.

The celebrated Russian General von Totleben,* and the above-mentioned lecture of a superior officer on "The Battle," favor the extended use of the first means. They assume that the fighting-front of an army corps, which is to carry out the main attack, must not be greater than 3,000 to 3,600 paces, and that its artillery must remain within this limit. As soon, therefore, as the infantry advances to the decisive attack there is no place for the artillery in front. They count, however, on an increased fire from the remaining artillery from its last position over the heads of the infantry against the enemy's position. To the moral effect on the infantry, which is heightened by the advance of the artillery, the only concession made is that "as a rule, the charge of the infantry is to be accompanied only by a

* See *Militär Wochenblatt.*, 1881, extra No. 10, p. 425, note.

few batteries of the divisional artillery, specially designated." In the above-mentioned lecture by a superior officer on "The Battle," the statement occurs: "the employment of large masses of infantry on the front of an army corps is a difficult problem; it would be more difficult if they *stood in rear of* the artillery. If we deduct from the fighting-front of an army corps—that is, from 3,000–3,500 paces—the 2,000 paces necessary for the artillery, only 1,000–1,500 paces remain for the passage of the infantry. In case the army artillery reserve was also employed even this interval would be diminished. The infantry is compelled, therefore, if it cannot, at the end of the artillery combat, pass gradually through the large intervals, to pass afterwards through the intervals between the pieces, and portions of the artillery must temporarily suspend their fire."

In the first place it must be noticed that by the addition of the general reserve of eight batteries, as proposed in the work, the entire front of the army corps will be taken up by the artillery. Let us regard the passage of the infantry of an army corps, which we will assume as formed for the principal attack in three lines, more closely. The depth of the infantry is about 1,200 paces, to which must be added the distance of several hundred feet at least, beyond which the rear of the infantry must have passed the batteries, before the latter can at the earliest resume their fire over the infantry. There will be a pause of nearly fifteen minutes, therefore, in the fire of the masked artillery. But what will prevent the enemy from reäppearing with all his artillery in his former position, in order to direct his most effective and rapid fire, *at known distances*, against the unprotected columns of attack? And what further consequences may be attributed to the undoubtedly annihilating effect of the enemy's artillery in such a case!

The proposed method is impracticable on ground visible from and commanded by the enemy's position.

Other important considerations also oppose the *fundamental* principle of the firing of the artillery over our own infantry *at such long ranges*, at *this* particular time: the moral effect, not only on our own infantry, but also on our artillery and on the enemy;—the materially better action of the artillery at shorter ranges;—the much greater effect of unfavorable light and weather, as in the production of suspended powder-smoke, mist, and dust, the sun shining in the face, etc.—the difficulty of making

the obstruction of the fire or the variation of the object aimed at by the far-distant artillery conform to the advance, from the last position of rapid firing of the infantry, which cannot always be recognized on account of the heavy smoke; an obstruction in the general advance is thereby liable to occur, because the front line of infanty will hesitate to charge into our own shells bursting close before them;—finally, the fact that the artillery may not arrive in time for the later phases of the battle, of which we will speak again further on.

Only when the relations of the ground are such as to exclude the use of artillery in front entirely, or only to a limited extent, as for instance in case of steep convex slopes on the side of the enemy, or broad, deep valleys, etc., *is the artillery compelled to fire over our own columns of attack at long range* (Wörth, Colombey-Nouilly, Gravelotte, Beaumont, etc.). It must be considered, however, that in that case the firing is greatly simplified, and in case of good relations of light is entirely safe up to the last moment; moreover, that the advance of the infantry over the dead angles of the ground is greatly facilitated. In this case the infantry will, in the first place, form *in front of* the artillery. This takes place, however, deep under the trajectories of the projectiles of our own artillery, and in the dead angle of the enemy's position. The profiles in figure 3 illustrate the difference in the two cases. In the case given, under cover of the advanced infantry subdivisions and the entire artillery, which is scarcely masked at all, completely covered, and hence closely compact rendezvous-formations of masses of infantry, eventually deployed by the flanks, are possible, which in the coming attack take their distances according to the front. Often in such cases the configuration of the ground permits the infantry to dispense with passing through the intervals between the masses of artillery. On the battle-field of Gravelotte, the bois de Genivaux, and of the Ognons, offered the opportunity to draw the infantry, completely covered, around both wings of the masses of artillery of the I. Army into the Mauce ground.

What measures must be adopted in case the ground does *not* favor the firing over our own troops?—The artillery *must* advance with the infantry in order to lend its essential assistance at short range. Various methods with a view to carry out these measures are possible. The following method endeavors, above all, to take account of the relations of space and time, laid down above, of

the main attack of the infantry. The lecturer is aware that it also has its objections. The first question to be settled is :

Up to what distance from the enemy can and must the artillery advance?

The French give no numbers, but do not forbid the near approach through the effective infantry fire. The Russians assume as a general case 400 s. = 800 m., but advance under certain circumstances even to the canister range. Our "Prussian Tactics" says only in a general way that the artillery in the decisive instant must not fear the infantry fire. As a rule, 750 m. may be assumed as a fixed average range, up to which the artillery must approach the foremost infantry line of the enemy. This will be sufficient to support with the greatest effect our own storming infantry *at least* up to its decisive rapid-firing position at 200–400 paces from the enemy's position. According to our latest infantry target practice, 700 m. is the greatest distance, at which infantry subdivisions can fire effectively on all objects.

The character of the position with respect to attack movements, configuration of ground, mist, smoke, etc., will probably often modify this distance. *Artillery posted on the inner wing of the principal attack* will be able to accomplish its object *without advancing so close.* If the ground at such close range obscures the field of view, the distance must be increased. If cover for nearer approach can be obtained, or if only partly covered positions occur, the distance is to be still further diminished. And if, at the *last* critical, decisive moment, batteries follow the general impulse to push forward, and even without cover strive to combat shoulder to shoulder with their sister arm, they should by no means be prevented. The knightly and dashing battery-chief certainly deserves no blame, but very often the *pour le mérite.*

When and how should the advance of the artillery from its principal position—which we will call the second—to its third position take place?

That the movement should take place in eçhelon, in order that the enemy's position can still be kept under *continued* artillery fire, is evident.

That the principal attack of the infantry, and conformably also the farther advance of the artillery, should take place, if possible, only after the enemy's artillery has been repulsed and the objective point of attack has been shelled by the artillery, there is no doubt. But as to the particular instant of the be-

ginning of this advance, neither the French nor the Prussian "Tactics" are specific. According to the older "Hand-Book for Officers of the Prussian Artillery," the artillery should advance as soon as the second line of attack has passed it. The Russians advance the artillery only after the infantry has passed it by a considerable distance, hence still later.

In order to determine the proper moment it is necessary to subject the relations of space and time to a careful test. Let us assume, *e. g.*, that, according to figure 2, the enemy establishes his most advanced firing line 400 m.* in front of the position, and that the skirmishers of our advanced infantry detachments have succeeded in establishing themselves about 500–600 m. therefrom, hence 800–1,000 m. form the enemy's principal position. The artillery requires from the time it ceases firing in the second position, which is assumed at 1,600 m. from the enemy's principal position, until it fires its first shots in the third position, about three minutes. The infantry requires for the march from the second position of the artillery to its own rapid-fire position, assumed at about 300 m. from the enemy's front infantry line, about eleven minutes. If we assume that the artillery limbers up and advances, as soon as the front line of attack of the storming columns reaches it, it will have eight minutes' time to fire before the infantry reaches its position; and several moments more before the arrival of the supports gives the line of rapid-fire the impulse necessary to take the enemy's advanced position. This is *sufficient* time to obtain a fixed effective rapid artillery fire at this range.

If the artillery delays its advance until it is passed by the second line of attack, difficulties regarding sufficient space are liable to arise, and, above all, at least seven minutes of the limited time allowed for its action are lost. How the Russian artillery is going to find time to fire, if not over their own troops, is not evident.

We abide therefore by our previously-expressed view,† that as a rule the advance of the artillery should begin as soon as the front attacking line of the *storming columns* has reached it.

Only those batteries in a flank attack, which are not directly protected by advanced infantry detachments, are compelled to advance later.

* Of the distance prescribed, 200–400 paces, we select for the sake of simplicity the larger number.

† "Field Artillery Tactics," p. 75.

The preliminary direct protection of the advance of the artillery must be given by the advanced infantry detachments. They must accordingly alter their positions, give up their cover, and give an intense musketry fire. That, notwithstanding, several advancing batteries may be rendered inactive for a short time, cannot be denied; they share this lot in the important decisive moment with many battalions. That this is, however, not generally the case, is proven by our late war, 1870–71; for instance, all the battles around Metz. Opposed to the long-range Chassepot the German artillery was often enabled to hold out for a considerable time at 660–700 m. distance, of course with enormous losses, but without becoming, in the majority of cases, even temporarily *hors de combat*. In our example, however, the following considerations have an important influence: The protection furnished by the fire of the portions of the artillery eçhelons not in motion, and the great improvements in the musketry *fire of the advanced* infantry detachments since the last war, as well as the fact that the prime object of the defender is to annihilate these storming columns advancing simultaneously along the entire line.

What position should the artillery take in relation to the front of the principal attack?

This can be best illustrated by two examples, represented in figures 4 and 5. The ground is supposed to be perfectly open, rising like a glacis towards the enemy's position. These examples are *not intended to furnish a model for all cases*. They only serve to show in a general way where the artillery finds positions without disturbing the main attack of the infantry. We do not pretend to say what form of attack is to be adopted, whether the flank attack, resulting, if possible, from outflanking the enemy, as in figure 4, or the purely front attack, the object being to make a central breach, as in figure 5. *Both* forms occur and must be taken into consideration. The positions lie:

1. In the front of the principal attack itself.
   a. Between the separate infantry brigades.

It will not be difficult to introduce two batteries here, the interval between pieces reduced to 15 paces as allowed by the "Tactics." They will require 180 paces to the front. In case of necessity these breaks in the infantry front may be rapidly and easily closed, if, in addition, in the second line of attack, the infantry

Fig. 4.

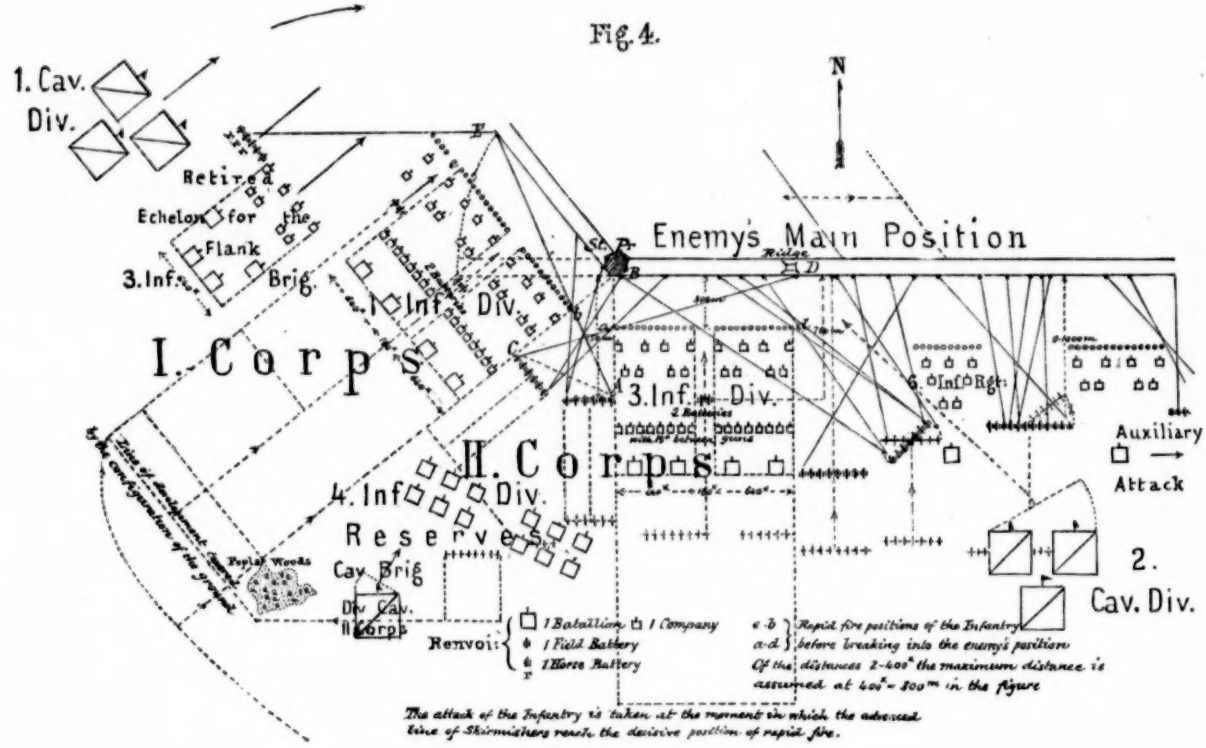
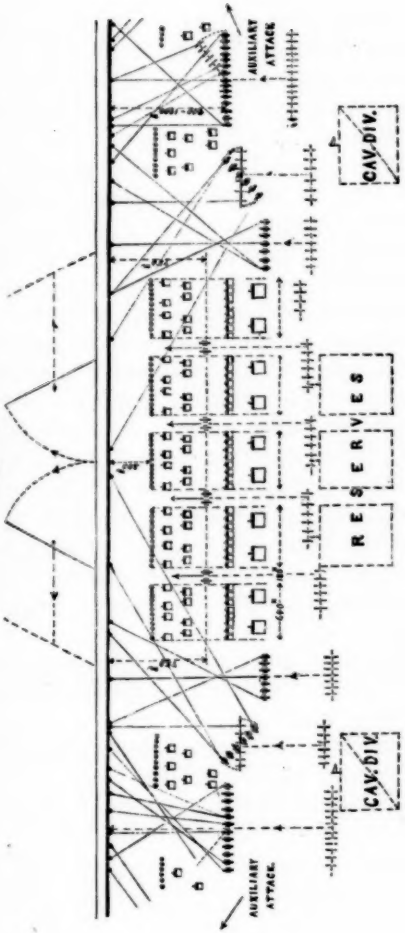

1. Cav. Div.
Retired Echelon for the Flank
3. Inf. Brig.
I. Corps
1. Inf. Div.
Enemy's Main Position
3. Inf. Div.
6. Inf. Brig.
II. Corps
4. Inf. Div.
Reserves
Auxiliary Attack
2. Cav. Div.
Cav. Brig
Div. Cav. II Corps
Poplar Woods
Renvoi:
1 Battalion 1 Company
1 Field Battery
1 Horse Battery
a-b Rapid fire positions of the Infantry
a-d before breaking into the enemy's position
Of the distances 2-400m the maximum distance is assumed at 400m - 800m in the figure
The attack of the Infantry is taken at the moment in which the advanced line of Skirmishers reach the decisive position of rapid fire.

Fig. 5.



WISSER.

subdivisions of *both* brigades, which are to deploy towards the batteries, are held in readiness.

b. At the pivot of our own flank attack, in case the decisive blow is to be given by a simultaneous front and flank attack.

When as may be desired,* to prevent the crowding of troops, a break is left in the beginning between the lines of the front and flank attacks, which is to be closed *the moment* the infantry enters the enemy's position, the greater portion of the artillery will find an excellent place in the preliminary break.

If the flank attack, as assumed in figure 4, takes place *accidentally* at an angle of 120° to our own, consequently at an angle of 60° to the enemy's original front, the artillery will find at this point, at 750 m. distance from the enemy's position, a space $A\,C =$ 750 m. = 1,000 paces, hence, according as the interval between the pieces is 20 or 15 paces, room for from 8 to 11 batteries, the direct action of which is possible up to the very last moment of the charge. Even after the infantry has taken up its rapid-fire position at 300 m. from the enemy's position, the artillery, from its reëntering angle, can cut up in the most effective manner, through a break of 300 m. = 400 paces, not only the enemy's flank, but also that portion of his front which has been drawn into the main attack. In case the rapid-fire position is taken at 240 m., as proposed in the above-mentioned lecture of a superior officer on "The Battle," these relations are not essentially changed; the back through which the artillery can in that case fire directly is 240 m. = 320 paces.

The space for the artillery becomes greater the more acute, and less, the more obtuse the angle between the flank and the front.

The battles of the last war furnish innumerable examples of the manner of using the German artillery in the front of the principal attack of the infantry (Elsasshausen; St. Privat-la-Montagne, etc.).

2. On the outer wing of the outflanking flank attack.

When several batteries are available, a formation eçhelonned towards the flank is to be recommended. If the ground permits the use of cavalry, the horse artillery will naturally be on the outer wing.

* This is desired, for instance, by His Excellency Lieutenant-General *von Stiehle*, Commanding General 5th Army Corps.

As shown in figure 4, the artillery on the outer flank is sufficiently secure. It finds opportunity there for effective flank fire (both batteries of the brigade of Woyna on the second day of Noisseville). It is also ready to advance against the cavalry troops, retired in eçhelon, and the offensive attacks of the infantry, which the enemy at the last moment of the charge generally directs with intact reserves of all arms against the flank of the outer wing (diversion of the French right wing from outflanking the left wing of the infantry division at Servigny by the flank attack of the 3d infantry brigade and three German batteries on the first day of Noisseville).

3. Close beside the *inner* wing of the principal attack of the infantry (fig. 4) or on both sides of the principal attack, when a central breach is proposed (fig. 5).

Here is an excellent opportunity for the application of artillery.

As we have seen above, and as is confirmed by the figures, the extent of the principal attack of the infantry is not so great that it cannot be most effectively supported up to the final assault on the enemy's position.

That, the front once broken, the artillery is in fact to hold the main point of attack under effective fire is taught by the lessons of war. In the assault on St. Privat-la-Montagne, *e. g.*, the Hessian batteries and several adjoining batteries of the Guard at the bois de la Cusse held the enemy in check in front of Amanvillers and on the height. The preponderating artillery, on the side of the inner wing of the main attack, consisting of the artillery of the Guard and batteries of 10th Army Corps directed, therefore, their fire only on St. Privat-la-Montagne and the height immediately to the south without regard to the losses produced by the enemy in the front.

Flank attacks by the enemy against the inner wing of the principal attack at the moment of final assault, from adjacent parts of the enemy's position (Cissey Division in the battle of Gravelotte) against which the general attack is not directed, are most effectively shelled by this artillery.

These artillery positions also often make it possible for divisions of cavalry, which are to be previously placed here in readiness, to take part in the principal attack in *this* part of the battle-field and assist in its decisive conclusion. They may, as circumstances offer, after thorough preparation by the mass of

artillery, press through the intervals to the attack, as did the cavalry brigade of von Bredow at Vionville. Previously, the presence of this cavalry adds to the protection of the artillery, with which the advanced infantry detachments are charged in the beginning. The latter, moreover, if the effectiveness of the artillery does not suffer thereby, may be employed conjointly for making demonstrations in the front (von Rosenberg battalion with the artillery of the Guard at the battle of Gravelotte).

But when the assault has once succeeded, and the enemy attempts to make new crotchets to the old front, the latter may be enfiladed by the artillery most effectively.

The insertion of such masses of artillery in the front leads to an economy in other troops, which may be used for the principal attack itself, and thus enable the latter the sooner to outflank the enemy.

Attention is further called to the fact that the principal artillery positions, intended to support the main attack, are also contained in spirit in the "Instruction" issued by Frederick the Great on the 30th of June, 1758, in the Camp of Prosnitz, to his colonels of artillery, von Dieskau and Moller. The problems to be solved by the artillery masses, on both flanks in a front attack, as well as on the inner wing and at the pivot of a turning movement, correspond to the rôle of the large battery of forty guns, which the king held on the inner wing of the advance guard, and of the eçhelon movement, from which, after the breaking of the enemy's line by a half turn of the subsequent flank attack, his oblique order of battle was developed. The battery of ten guns on the outer wing of the advance guard corresponds in many respects with the artillery which we employ on the outer, turning wing.

It is not necessary to remark in particular that in the selection of positions in the manner indicated *not all* the batteries find application in front; nor that the relations do not always render it possible or desirable for the artillery to take up *all* these positions.

It is, therefore, of importance to arrange these positions in the order of their importance, *irrespective of the configuration of the ground.* This comes into consideration, too, in the deduction of the positions of the artillery in the combats of detachments, etc., from the offensive battle.

First in importance are the positions on both flanks of the front attack,—on the inner wing and on the pivot of the flank in the turning movement.

Second, those on the outer flank of the turning wing.
Third, those which are inserted between the brigades.

The relations of the concrete case must determine which of these positions is to have the preference, to prevent too great a separation of the artillery.

In small detachments, in which a flank attack is converted at the last moment into a complete turn, the positions on the pivot of the flank and those on the inner wing coincide. A *single* battery is, however, as a rule, best placed at the pivot, if the *ground does not demand a different arrangement*.

Let us glance once more at figures 4 and 5, in order to answer the question: In what way is the eçhelon movement best conducted?

It is apparent that the large masses of artillery, which should be posted on the inner wing of the flank attack, and on both wings of the front attack, should advance.

From the character of the infantry attack it follows that there is no room at *this* moment for the artillery to pursue to fine positions. As a rule, it is simply a question whether it must advance farther in the direction indicated, or retire in order to take part in the action; it is not possible, as a rule, to move out laterally from its assigned place.

V.—INTERRUPTION OR REPULSE OF THE ATTACK.

New views on the employment of artillery in such moments of a battle have not been advanced.

With reference to the recent propositions to keep the artillery far in rear, we will call attention to another point in particular.

When artillery is placed *in the front* in direct connection with the infantry, it furnishes infantry, retreating in disorder, with fixed rallying-points, either to renew the attack with newly-arrived reinforcements, or to organize the retreat. Excellent examples in this connection are furnished, for the first case, by the engagements at the battle of Wörth between Niederwald and Elsasshausen, for the second case, by the conduct of the batteries which had accompanied the unsuccessful attack of the brigade von Wedell at the battle of Mars-la-Tour and Vionville.

Artillery *kept far in rear* can only protect retreating infantry with certainty and induce it to halt in front, in case the *ground is favorable* and furnishes natural covering and rallying-points (Gravelotte). In the *contrary case* the infantry masses will fly

towards the artillery, and more or less completely mask its fire, giving an offensive assault of the defender with all arms the best chance to occasion a complete catastrophe.

VI.—SECURING THE CAPTURED POSITION AND PURSUIT.

On this point also no new views have been advanced. I will consider it, therefore, in the same relation as above.

In case the entire artillery remained far in rear during the charge, say, as in example of General Totleben, at 2,000 m. from the enemy's position, in order to keep up the firing over the storming infantry to the last moment, it cannot be at hand in time to secure the captured and occupied position against return-offensive attacks. And just such ground as favors the firing at long range, on account of its profile relations, impedes, as a rule, the advance (Valleys of Beaumont, the Mauce at Gravelotte, etc.). The preparation also by the artillery for the further attack of new entrenchments, behind the captured position, occupied by the enemy, will be considerably delayed.

Let us assume that the German infantry, which made the attack on St. Privat-la-Montagne, had been supported up to the last moment by artillery far in rear. What would the situation have been if, just at the moment the storming of the village was effected, the French Guard Corps had advanced to the attack of St. Privat-la-Montagne, from the bois de Fêves and the quarries of Amanvilliers, as was quite possible? The place would have probably fallen into the hands of the French again.

The artillery, when left far behind, may easily fail to arrive in time to take proper part in the pursuit.

Accompanying the principal attack of the infantry by a few separate batteries, as recommended by the above-mentioned lecture on "The Battle," will not entirely overcome the present difficulties.

Hence, these later moments of the battle also demand the presence of large masses of artillery in the decisive principal attack of the infantry. Even when the ground, to be crossed by the principal attack, furnishes no opportunity whatever for artillery positions in front, the *entire* artillery can *by no means* continue firing, from its distant position, up to the *last* moment of the assault; a fixed portion must have been set in motion towards the front some time before.

VII.—ORDERS FROM THE STANDPOINT OF THE HIGHER TACTICS.

We will simply explain in this connection how the *positive assertions*, which have been made in the treatise, may also be realized without difficulty in the way of orders on the part of the superior commanders, and what dispositions of the higher tactics appear appropriate with reference to this employment of the artillery.

I turn first to the commander-in-chief of the army. As soon as the principal attack is clearly decided upon, the commander can arrange the insertion of artillery of the reserve corps, at least, of the corps artillery, in order to annihilate or disperse the portion of the enemy's artillery which may oppose the principal attack in conjunction with the artillery already engaged in the action. In case the army has a special chief of artillery he now receives orders to conduct this artillery combat, and for this purpose the respective artillery-brigade commanders are placed under his orders. It is necessary that this chief of artillery should be kept informed of the steps in the general plans of the commander-in-chief, in so far as they relate to the principal attack. It is of great importance for him to know the *very earliest* moment in which he can count on the main attack of the infantry, or, the very *latest* moment in which this *must* take place, and what part of the enemy's position is to be included in this attack, in order to arrange the intensity of fire and its systematic subdivision accordingly. As a matter of course the latter orders can only be very general; it is only necessary to limit the work to be performed by the respective brigade commanders, etc.

When possible, however, the commander-in-chief will publish a general order relating to the principal attack of the infantry. The following order for the necessary dispositions, which makes no pretentions to value as a model, will serve as an example to illustrate fig. 4. It is assumed that the flank attack of the 1st Army Corps (one brigade of which is detached) has to make a somewhat longer march from its covered place of deployment into line, from the poplar woods to the village of St. Pr., than the line of front attack of the 3d Infantry Division from its place of deployment; furthermore, that the flank march of the I. Corps and the 1st Cavalry Division has begun its advance, but so much time must elapse before its completion as will suffice to complete the preparations necessary on the part of the artillery; —finally, that the 3d Infantry, its line developed, rests.

HEAD-QUARTERS OF THE ARMY.

GENERAL ORDER.

The I. and II. Army Corps will attack the right wing of the enemy by a flank attack.

The I. Army Corps will turn with one division against the flank and will order one brigade to follow on the outer wing in echelon. The inner wing of the army corps will move from the western edge of the poplar woods directly towards the southern point of the village of St. Pr. The decisive attack will commence as soon as it is completely developed.

The 3d infantry division will attack in front. Its left wing will also take the southern point of the village of St. Pr. as its point of direction; the right wing cannot extend beyond the ridge lying immediately to the left of this village. The division is to advance so that it will reach the village of St. Pr. at the same time as the I. Army Corps.

The 4th infantry division follows as reserve at 800 paces behind the centre of the attacking line.

General A. (Chief of Artillery) will form two masses of artillery to support the attack at close range. One will preserve the connection between the I. Army Corps and the 3d infantry division; it will conform to their movements. During the flank march of the I. Army Corps the combined divisional cavalry of the II. Army Corps will be charged with its protection. The other mass advances at such an early hour as to have reached its advanced position and opened fire on the object of attack, when the 3d infantry division reaches, with its most advanced troops, the artillery positions by this time established in the front.

The 6th infantry regiment, which has been pushed forward towards the enemy's position at the courtyards of X. will assume, as a special support, the protection of the artillery mass of the right flank.

General A. will reserve for each of the infantry divisions which are to make the principal attack, a half regiment of artillery, in case this is not already done, and if possible their own, to accompany them during the charge.

The 1st cavalry division will secure the left, the 2d cavalry division the right flank of the principal attack.

Messages will meet me on the right wing of the 4th infantry division.

At the south entrance of H.

FRHR. V. M.

February 11, 1882, 1½ o'clock P.M.

From the fact that, up to the beginning of the decisive attack of the infantry, only infantry detachments with intervals have nestled in the front of the enemy's position, there can be no want of space for the deployment of the large masses of artillery.

From the relations of the problems to be solved by the artillery to the entire progress of the attack, it follows that the commanders of the artillery should be fully informed of the wording of the general order to attack.

In case difficulties as to space for the troops, and unnecessary masking of the artillery are avoided, the order for attack must

contain, as above, the extent of the enemy's front to be drawn into the main attack, as well as the lines of development and direction of march for the front and flank attacks.

The rule that the commander-in-chief charges *one* artillery general with the general dispositions of the artillery in the principal attack, corresponds to the method of Napoleon I. in his battles. Very often a general of artillery received during the battle the *power* and *orders* to collect a large mass of artillery, in order to employ it at a decisive point. Frederick the Great, too, desired for this stage of the battle and during it, to undertake a further concentration of his artillery, as appears from the instruction of 1758 to the Colonels von Dieskau and Moller. The 3d battery of twenty guns, which was posted on the refused wing, was finally to combine with the large battery of forty guns, accompanying the inner wing of the principal attack. Such a rule is evidently necessary, because these masses of artillery, during the principal attack, must very often invade the fighting-sector of the army corps adjacent to the auxiliary attack; furthermore, because the artillery, in the preceding decisive artillery combat against the enemy's artillery, will have suffered very different losses on the different parts of the battle-field, so that on this account alone a redistribution of artillery between the army corps, divisions, etc., will be necessary. We must also consider the probable fact that the artillery, that had to carry on the principal attack against the enemy's artillery, has dwindled by this time to such an extent—at least as regards *immediate* fighting capacity and mobility,—that requisitions for a supply of artillery must be directed to the neighboring army corps of the auxiliary attack. It is beyond the scope of this treatise to call attention to the rules for best preserving the artillery, during the early periods of the battle, in fighting and marching condition for the further advance.

It follows as a matter of course that the division commanders, at the moment of the decisive infantry battle, resume direct command of that portion of the artillery which is directly connected with their divisions, and, is to be inserted in its front and advance with it. The commanders of subdivisions receive their instructions from the division commanders or from their staff-officers, including the extent of development of the lines, and the points of direction for the attack of the divisions, as well as points at which the artillery shall insert itself. By rapid reconnois-

sances, they are readily enabled, by selection of intermediate points of the ground, to determine the direction of the next advance of the artillery.

Although desirable at this time to return each artillery subdivision to the division to which it belongs, it is not always possible. These very subdivisons may, in consequence of the great artillery combat, be temporarily not sufficiently capable of moving and fighting. Their positions in the large artillery masses may also have become such, that their employment with their respective division is impossible, without long circuitous marches, and without attracting the enemy's attention to what is being prepared, etc.

Such a desire is the more practicable when the artillery-brigade commanders, as early as the development of the artillery for the principal artillery combat, have studied the proposed dispositions of the divisions, ordered by their commanding generals, for the advance, and have thereby been able to place the artillery accordingly in the ground covered by the army corps.

Even if the divisional artillery of the 1st army corps has taken part in the combat with the enemy's artillery (the artillery of the 12th Army Corps at Gravelotte), it will more readily follow its subsequent movement.

It will be the duty of the corps or division commanders to notify the infantry detachments, advanced within the limits of their commands, in sufficient time before the beginning of the final assault, that they may take the necessary measures to insure the protection of their advancing artillery.

The sixth infantry regiment, supposed to have been pushed to the front, in the sector of the artillery mass of the right wing falls naturally, as a special protection, under the command of its leader, whose orders alone it obeys.

From the foregoing, the case in which (in fig. 4) only *one* army corps is in first line, a general reserve being furnished from other troops, may readily be deduced.

The same principles apply in the dispositions for the simpler front attack, represented in figure 5.

CONCLUSIONS.

From our lecture we may conclude :

1. That *the artillery at the present day still finds sufficient space* to take part in the decisive infantry attack *at short range* and in

large masses, *provided only the ground in front offers the necessary positions.*

2. That the positive assertions set forth in Article IV. on the employment of artillery at short range are capable of execution, and also make no demands on the commanders-in-chief which cannot be conveniently taken into consideration in the general orders.

Reality furnishes *battle-fields with varying ground* and *various other relations. The battle will constantly vary accordingly. The direction of the attack and the employment of the artillery therein can never sink to insipid, mechanical work according to a model,—they are and must ever remain an art.*

[A TRUE TRANSLATION.]

John P. Wisser
1st Lt. 1st Artly.

BATTLE INTRENCHMENTS AND THE PSYCHOLOGY OF WAR.

By CAPTAIN JAMES CHESTER,

Third Artillery.

In a paper on this subject, written at the Artillery School, I defined battle intrenchments to be "the temporary fortifications which grow up around an army during its manœuvres in presence of an enemy." I might have said *irregular* instead of *temporary*. But the definition expresses my idea fairly well; the strong point being that battle intrenchments *grow up*. They are not built in accordance with any general plan, and are, in fact, a conglomeration of independent intrenchments cemented together in the matrix of the line of battle.

Such fortifications are necessarily irregular. They would break the heart of any old-fashioned engineer. But they have been known to do good service, and, at the end of our war, were recognized by many as essential adjuncts to defensive tactics. But they have not always been so considered. Before the advent of the rifle, battle intrenchments, even of the defensive kind, were unknown on the battle-field. There were, of course, *intrenched lines* like those of the Torres Vedras; but they were regular; built in accordance with the plan of an engineer. Battle intrenchments are of a very different character; such, for instance, as the improvised intrenchments thrown up at Chancellorsville by the Army of the Potomac after the disaster to the 11th Corps. There the line of battle was hurriedly formed, and the intrenchments were hastily added by the battalions and batteries, each working according to its own plan. The result was an intrenched line which the soldiers appreciated, in spite of its irregularity. It was their creature. They believed in it, and would have defended it to the last extremity.

There is more sentiment in soldiers than the average engineer will willingly admit. To him they are merely physical machines —centres of force—the value of which can be calculated. He recognizes no psychological problems in his art. Like the Kriegsspieler he plays with soulless men; unthinking things with neither stomachs nor imaginations. Whereas the real pieces on the chess-board of battle are living creatures, with likes and dislikes. They may not know much, but they can think, and they hunger and thirst, and get tired, and obstinate, and sulky, just like philosophers. They are patriots, too, after a fashion, and will frankly admit that it is a glorious thing for some other fellow to die for his country, but there the sacrifice should end.

There is a vast difference between real and ideal soldiers. Men who can perform wonders, theoretically, with the latter, will frequently find great difficulty in doing any thing at all with the former. There are many commissioned failures in every army, who are brave, skilful, and scientific. Officers can be made, but, unfortunately, commanders must be born. There is a subtle something in the real commander, which those who come in contact with him can feel, but cannot define. It is a something which manifests itself in emergencies, and gives its possessor great power on the battle-field. It is that key-stone of the arch of success, which skeptics irreverently call luck. Cassius never could understand why Cæsar should be great; and Cassius is the type of a class which has outlived the Roman Empire. By them success is still attributed to luck, and failure—if it is their own—to misfortune. The captain who finds himself deserted by his men at the critical moment, damns their cowardice, and never dreams that the fault may be in his own make-up. The art of command requires something more from its masters than the ability to issue correct orders. It requires something more than courage, skill, and daring. It requires the ability to read and the power to control the minds and spirits of the soldiers. The real master of the art is he who, when his men are scared to death and wavering on the very verge of flight, can steady them down with a word, as a skilful driver quiets a nervous horse.

So I maintain there is a psychological problem closely interwoven with every military one, whether it refers to material or men. I do not claim that intrenchments have souls of their own; but I do assert that they have a marked effect upon the souls of the soldiers. Men will fight better behind some intrenchments

than others; and, best of all, behind those of their own construction.

I believe in the home-made battle intrenchments. I believe in popularizing the art of fortification. And I believe that on the battle-fields of the future improvised intrenchments will be as essential to success as marksmanship. Soldiers must be taught how to take full advantage of all convenient natural cover, and to improvise cover where natural cover fails. In this way they will be able to do effective work with comparatively little loss.

But many soldiers of wide experience disbelieve in cover. They hold that cover is a cause of cowardice on the battle-field; and assert that troops accustomed to it are worthless in the open. One of our most distinguished generals recently deprecated "*dirt digging*" in an official report. He said in effect that officers of a certain corps were too fond of dirt digging to care much about old-fashioned fighting; and although he withdrew, or rather expunged the impolitic remark, some officers who knew him well, insist that he did so merely because his assertion was impolitic, and not because it was untrue. Be that as it may, the fact remains that that distinguished officer asserted that "dirt digging" and fighting were incompatible. Now he had a wide experience, a clear head, and a ready pen; and while he may have written much which he afterwards regretted, he never wrote a word he did not believe. I am compelled to admit that he is against me on the subject of battle intrenchments.

I am tempted in this connection to invite attention for a moment to recent criticisms on the battle of Shiloh; especially as we are likely to have more of the same sort in the future. The key-note of complaint in all these criticisms is the same—carelessness,—and the proof of its existence is found in the fact, that there were no intrenchments of any kind at the advance posts of the army. I submit that the proof is insufficient. If the general at the front did not believe in intrenchments; if he believed that intrenchments would impair the aggressive qualities of his troops —and I believe that he did then, and does now, so believe—why of course he would build none. I doubt very much if he were in command of an aggressive army to-day, that he would risk the effect upon its *morale* of putting it behind breastworks. And he is not singular in this respect. He has many distinguished companions.

Napoleon disbelieved in intrenchments. If, after forming his

lines at Waterloo, he had covered his front with intrenchments, what would have been the effect on the *morale* of his men? Would their aggressive powers have been increased or diminished thereby?

Wellington was on the defensive on that occasion, and commanded comparatively green troops, yet he abstained from intrenching his line of battle. He had ample time to prepare the buildings and enclosures in his front for defence, and might have intrenched his line of battle if he so desired; but he did not. Was he ignorant of the value of defensive intrenchments? Had he forgotten the lines of the Torres Vedras? or was he afraid of the effect of intrenchments on his men?

At Chancellorsville, General Hooker commanded an aggressive army, and fancied that he had won the weather-gage of his adversary—at least he so asserted in an order of the day. What effect did these facts have upon the mind of General Howard? He is savagely censured for failing to fortify. Did he believe in breastworks under the circumstances?

When General McClellan arrived in front of Yorktown, he could have broken through Magruder's lines at almost any point. This, I think, is generally conceded. His army was full of confidence, and inexperienced enough to attack any thing. But he began digging dirt, and in less than a week his men imagined themselves before a second Gibraltar.

At Fredericksburg, Humphreys' division of nine months men charged upon Marye's Heights in a way worthy of veterans, and met with a bloody repulse. But they were not demoralized. Organizations were maintained, and the line stood for hours in the open, under a galling artillery fire, without flinching. After dark, however, when Warren began to fortify his front, the feeling among the same men became panicky. If Warren had begun work in the morning, the nine months men never would have charged.

There is no doubt that soldiers learn to read the phases of a battle with almost absolute accuracy. The appearance of picks and shovels on this occasion, told them—what their own bloody repulse had failed to do—that the army was defeated, and their *morale* was affected thereby.

There is no use in multiplying examples. The history of our war is full of them. I am willing to concede that to a certain extent, and perhaps a very large extent, the minds and fighting

qualities of soldiers are affected by the constant use of intrenchments, and that a resort to intrenchments, under certain circumstances, does affect their *morale*. I admit that an army which has been defeated in an entrenched position can hardly be expected to make a stand in the open against the same enemy, on the same day, or perhaps for many days. And I admit also, that it is very difficult to get a line of battle to leave intrenchments and advance under fire in the old-fashioned way. There is no blinking these difficulties. They are real, and perhaps serious, but not so serious as they seem at first sight. Let us look at them more closely.

First Difficulty.—The fighting qualities of soldiers are affected by the habitual use of intrenchments. We are frequently confronted with this assertion, and we too frequently admit it, without qualification or limitation. We rarely inquire into the degree, or direction of the effect so readily conceded, or ask if it really is injurious. So far as my experience goes—and it accords with my reasoning on the subject—the soldier who has been accustomed to fight behind breastworks, will always be a zealous dirt digger. Whenever, and wherever he is halted, he will turn his attention to the spade. He feels naked and exposed without intrenchments, but valiant and strong with them. I submit therefore, that his fighting qualities are not injuriously affected. Men fight best when they have confidence in their own prowess —when they feel that they are superior to their adversaries. And this men behind intrenchments always do. They may be afflicted with timidity in the open. But timidity in the open excites exertion with the spade, and the resulting cover induces confidence. On the whole, the injurious effects of intrenchments on the fighting qualities of soldiers, are more than counterbalanced by the beneficial; if the commander knows how to utilize mental conditions.

Second Difficulty.—An army beaten in an intrenched position may as well be taken off the board—at least for a time. I admit that and more too. Precisely the same results ought to follow defeat in the open. A defeated army in either case must retire on reinforcements, or intrenchments, before it can be expected to make another stand. There are no special evils resulting from the use of intrenchments in this case. The fact is, the victors of our war have taught us bad lessons on this subject. In too many instances they failed to drive their victories home, and have thus

given us wrong ideas of what a victory ought to be. I have seen armies beaten on one day, and ready for battle on the next; and the fact was considered conclusive evidence of pluck. In reality pluck had nothing to do with it. Either the army retired before it was beaten, or the victor had not sense enough to pursue. Hood's army made no such exhibition after Nashville. Neither did Early's after Cedar Creek; nor Lee's after the series of battles which followed the breaking up of his lines before Petersburg. In every case they were off the board. And so it should always be.

Third Difficulty.—It is very difficult to get a line of battle to leave intrenchments and advance under fire. I have already admitted this, and am prepared to go further. I believe it would be impossible to do so in the old-fashioned way, against such a volume of fire as modern breech-loaders could bring against it. But there is no necessity of doing it in the old-fashioned way. The advance, under the conditions supposed is undoubtedly a difficulty, but war is a difficult game to play, and commanders must learn to overcome difficulties. If the old way be impracticable, a new way must be devised; and a new way has been devised in this case. There always will be found, in every army, daring spirits who glory in just such difficulties; and this material must be utilized. The advance from cover, under a deadly fire, must necessarily be made by squad rushes—at least until assaulting distance is reached. Squad leaders and platoon commanders, if they have been properly selected, will vie with each other in this kind of work. It affords the very opportunity that daring spirits are always longing for on the battle-field—a chance for distinction. What greater stimulant can a brave and ambitious sergeant desire, than the knowledge that the eyes of his captain, and his colonel, and his whole regiment are on him. I verily believe that the advance under fire, under such circumstances, would be more prompt, dashing, and effective than it ever was at the command "Forward! Guide centre!" in its palmiest days. Emulation and ambition would obliterate timidity in the squad leaders, and timidity would insure celerity among the men. No soldier dare hold back under such circumstances. No soldier will confess cowardice in the face of his regiment. He will follow his leader or die. And the leader, the sergeant, will no longer be an obscure individual in the line of file closers on the battle-field. He will be a leader in fact.

When his captain tells him it is time to go, he will go. He has already fixed his eye upon the goal which he desires to attain on the next rush. He brings it to the attention of his squad, and then, looking around to see if his men are all there, he gives the word "*Come!*" and away he goes with his squad after him like a flight of birds. It is a foot race for the selected spot. They reach it in less than a minute. In two minutes more they are fairly covered, for they will soon become experts at that kind of work. And thus squad after squad is sent forward, until the whole line has been advanced. It is not half so dangerous as running a flying sap. It is certainly more easy and certain than the old-fashioned way, and the only effect that the intrenchments can have, will be to shorten the exposure and diminish the loss.

So we see that the arguments against battle intrenchments, when viewed at close quarters, are not so convincing as they seemed to be when seen from a distance. I predict a glorious success for the commander who first introduces aggressive battle intrenchments on the battle-field. Defensive battle intrenchments are not a novelty. Wherever they have been fairly tried they have been successful, and they are yet in their infancy. Their future is secure. The aggressive kind, however, have hardly been born yet, and it is never wise to accept a purely theoretical argument as conclusive. We must wait, but we wait in confidence. The mental effects of agressive intrenchments have been misunderstood. They belong to the psychological side of the art of war, which is rarely studied. It has never, in fact, been written up, and as it cannot be measured by mathematical rules, it is not likely to be in the near future. War colleges will continue to teach what the great masters did, and thus produce an army of copyists. Masters are not made in that way. If we could only know what the great masters thought, we would be much nearer emancipation. The psychological side of the art of war is not a popular study, perhaps because it is a hard study. No man cares to admit that his personal courage depends largely upon circumstances and influences over which he has no control. Young soldiers laugh at such assertions; old soldiers become superstitious over them; and religious soldiers claim that the God of Battles intervenes in that way. But military psychology, although a rare, is not a new study. It has been the life-long occupation of every great commander. It is

real, important, and fascinating, but it cannot be profitably discussed. It belongs to the forum of the individual brain. I therefor turn to the physical side of the subject.

Battle Intrenchments naturally divide themselves into two classes: trenches of defence and trenches of attack. Their functions are similar to those of the *intrenched lines* and *regular approaches*, described in the text-books; but their conception, construction, and general appearance, are entirely different. They cannot be described in detail, because they are never twice alike.

Their character depends as much upon the circumstances and conditions under which they are built, as upon the men who build them. I shall address myself, therefore, rather to the proper times and methods of their employment, than to their character.

First, then, as to defensive battle intrenchments. They are simply improvised imitations of intrenched lines, thrown up by the troops on the eve of a defensive battle, to lessen the losses during the first stages of the engagement. Modern battles consist of three distinct parts or stages. During the first or artillery stage, the assailant advances his forces from, say the 3,000- to the 1,000-yard range. During this advance the battle on both sides is an artillery one. The assailant masses his batteries against the batteries of position of his adversary, his object being to disable or destroy them. During the second stage, the assailant pushes his infantry forward from the 1,000-yard range to assaulting distance, and the battle on both sides is by artillery and infantry. The fire of the assailant, during this stage, is directed towards keeping down the fire of his adversary, and covering the infantry advance. The third stage—the assault—is purely an infantry contest. The first and second stages are each of many hours—and, it may be, even days—duration. The third is over in a few minutes. Now, if the defender's troops are covered by even improvised intrenchments, their losses must be less during the first two stages than those of the assailant; and if equality of force existed at the beginning of the battle, the defendant will enter upon the third and decisive stage with the odds in his favor; and these odds will be largely increased if the assailant has not resorted to intrenchments.

Heretofore the initiative has been considered an advantage. It is very doubtful if it will be so considered in the future. A general may elect the defensive for political, strategical, or even

tactical reasons, even when he feels himself the equal, and perhaps, the superior of his adversary; and when he wishes by one decisive blow to put an end to the war, it will be wise for him to do so. For instance, an army meets an invader on the frontier, and finds him, or suspects him to be, stronger than itself. It retires before him slowly and systematically, gaining strength as it shortens the line of communications; while its adversary, in following, drags an ever-lengthening chain, which saps his fighting force, and finally makes him inferior to his enemy. Then is the moment for the defender to deliver his blow. He must fight a successful battle, seize the initiative, and kick the invader, broken and routed, over the frontier—if he cannot capture or destroy him. When such momentuous issues are involved, no chances should be thrown away. Although he may feel superior to the invader, he should strive to increase the odds, so that he may be able with more certainty to destroy as well as defeat his enemy. For this purpose then, if for no other, he will resort to intrenchments.

When the proper moment has arrived the defender prepares to receive the invader's attack—for he will attack, and at once. He will never relinquish the initiative without a struggle. The defender's retreat having been orderly and slow, he has been able to select the battle-field with due deliberation. He has a reconnaissance map of the position. He marks thereon the commanding points along the selected line. These are the key-points of the position. They must not be more than a mile apart; they may be less. If any two be over a mile apart, a key-point must be improvised between them. The key-points are the bastions of the line. On them he posts the divisional artillery,—say two batteries on each, with 400 infantry as supports. From such positions his guns will command the ground in his front, and cross their fire with their neighbors on the right and left. The infantry of the line constitute the curtains of the various fronts. These need not be straight lines, but will occupy the most advantageous ground, between key-points: never, however, advancing in front of the line joining the rear of the key-points. In this way the key-points will stand out in front of the line, as bastions do in front of the curtain.

Advance posts, the counterparts of demilunes, are selected on convenient key-points, a half or three quarters of a mile in front of the main line, and mid-way between main key-points; and the

supports are established at corresponding points in rear of the line. The reserves and reserve artillery are posted in positions where they will be hidden from the enemy, and, at the same time, convenient for pursuit. The cavalry and horse artillery are posted on the flanks. There will be no difficulty in fitting the army to such a line, as each link will be the counterpart of every other link.

As soon as the troops reach their positions, they fortify, as they have been doing, on a less elaborate scale, perhaps, in every bivouac they have made during the retreat. In a short time formidable intrenchments will grow up, behind which the defenders await attack. Such a line is bound to be a surprise to the assailant. His spies know nothing of it. The country people—who never could conceal its existence if they had ever seen it—cannot give it away. And even a reconnaissance in force, advancing as it would after the day's march, could hardly unmask it before darkness puts a veto upon that kind of work. Not before morning will the invader become aware of its existence, and then he must attack at once or surrender the initiative, and confess that the wave of invasion has been stayed. As a rule, he will attack.

The use of the intrenchments thus improvised has been already explained, namely, to diminish the losses during the first two stages of the battle, and increase the odds, assumed already to exist, in favor of the defender. In the third stage of the battle, it is fair to assume that the assailant will be repulsed, and the moment will have arrived when the defender must abandon his intrenchments, and seize the initiative. He should never leave contact with the enemy after the mêlée is joined over his own breastworks, until he is utterly routed. The counter attack must be driven home with vigor, even if every life saved by the intrenchments in the first stages of the battle, should be lost.

The success of the counter-charge depends very much on the instant when, and the energy with which, it is delivered. Of course, there can be no fixed rule on the subject. The defender must not allow himself to be drawn out by a false attack; and he cannot afford to lose an opportunity. If he is sure the attack is real and in force, then he should maintain the contact, thereby closing the mouths of the enemy's cannon, and utilizing the confusion occasioned by repulse.

If he permits the enemy to retire to cover or comparative

safety, he has immensely increased the difficulties of the situation, and a terrible battle must be fought before he can claim the initiative. His adversary has not been defeated. The failure of an assault on an intrenched line, is never accepted as a defeat. The intrenchments are credited with the repulse, and the baffled assailant generally longs for a lick at his adversary in the open. He will be elated, therefore,—if he has been allowed time to recover himself—when he sees the latter leaving his trenches; and he will fight, for a time at least, with all the confidence of superiority which the previous pursuit has engendered. This, then, if the battle has been allowed to drift into such a shape, is the critical moment. The friendly shelter of the breastworks will have a powerful attraction for troops who feel, for the first time, the withering effect of their adversary's fire; and it will require almost superhuman exertion, on the part of the officers, to keep them to their work; but if the whole army is thrown forward, vigorously, enthusiasm may sustain it, until the calm consciousness of physical superiority ensues, and the initiative has really changed sides. Still, the general who fails to follow the receding wave of the assault, should be court-martialled for incompetency, if not cowardice.

I have said, incidentally, in discussing this subject, that certain features of our war taught, or at least tended to teach, very bad lessons. Perhaps it will be well for me to define my position on that point a little more clearly. Many of our victorious generals merely defeated their adversaries,—and this applies to the South as well as the North. They seemed to forget that it was their duty to destroy them. Lee's army, for instance, should have been destroyed at Antietam, and again at Gettysburg; and the Union army should have been cut to pieces, or captured, at Fredericksburg, Shiloh, and, perhaps, Bull Run. These are glaring cases. Many more might be cited. In every case, destruction should have followed defeat, and it did not. But there were instances where it did. Nashville, Cedar Creek, Jackson's Winchester, and Appomattox are examples. In each of these the victor destroyed his adversary. The defeated army was off the boards.

I am never so much inclined to believe in born generals as when I get thinking about the psychology of war. The ability to feel the pulse of a whole army and count its heart-throbs in the heat of battle—to be able to tell what it will do, and what it

will not do—is a gift rather than an accomplishment. It is a sort of inspiration. Men can teach men how to obey, but God alone can teach them how to command. A master of the art of war must know both. With the first alone, he may become a respectable practitioner. He may be able to organize armies, fight battles, and perhaps win victories, but the chances are that he will always let his crippled adversary get away. With both he will always be able to gather the fruits of victory. To be a great general, a man must be born to command and educated to obey.

But I am neglecting aggressive battle intrenchments. They are to the battle what regular approaches are to the siege—a means of getting within assaulting distance of the enemy without serious loss. They are not described in the text-books, and, so far as I know, have never been practised in the field.

Before recent improvements in fire-arms had widened the danger zone, the attack was but a spurt; the exposure was short, and the danger moderate. Officers always minimized the dangers, and led their men into the very jaws of death under false pretences. They relied entirely upon the enthusiasm of their men, and doubtless held that the deceit practised was justifiable. It was all the same to the soldiers, as they were likely to be dead or victorious before they found out the truth. It is different now. The attack must be driven over at least a thousand yards of deadly space before even the assaulting point is reached. This requires a continuous effort and considerable time. Not one short spurt, but ten or fifteen are required; and if the enemy is behind breastworks, few of the assailants will reach the assaulting point. In short, it is impossible to make an open front attack against intrenched infantry. For proof I point to Plevna. There the Russians sacrificed thirty thousand men on the altar of conservatism to prove the impossibility; and a like number of gallant Germans fell at St. Privat—the victims of false pretence. These exhibitions are not creditable. A repetition of them would be disgraceful.

I believe it would be a blessing to our profession if the whole literature of the art of war was destroyed. Young minds are so easily poisoned by the dogmas of the text-books, and such learning is so hard to get rid of. What quantities of blood have been needlessly shed in ignorant imitation of Napoleon! Who can think of his "column of attack" without hearing the wail of that Russian column marching to inevitable destruction at the battle

of the Alma? Who can think of an open assault upon covered infantry without seeing the thirty thousand dead which garnished the acclivity before St. Privat, or the glacis in front of Plevna? Such criminal waste of human life deserves at least professional censure. But it rarely gets it. It is more apt to be referred to as a "sanguinary and glorious affair," and, saddest of all, copied by some learned leader in the future.

But if we admit that a frontal attack in the old-fashioned way, against covered infantry is impossible, what then? Is the game blocked? Certainly not. We must meet cover with cover. We must resort to aggressive battle intrenchments.

In explanation of such an attack, I offer the following:

The first stage of the battle is over. The enemy's artillery of position is more or less effectually silenced. The attacking infantry have worked their way to the front, and now stand, concealed, behind the 1,000-yards range. They are in close column of companies by battalion. The battalion consists of three companies of the line and one company of marksmen. The companies are 120 strong. Excuse my ideal organization. I believe it to be the best that can be devised under existing clrcumstances. With it the battalion forms a handy link in the line of battle. With it real marksmen can be used to best advantage. The real marksman must be a man of nerve, as well as a good shot. In the average company perhaps one man in four will be found to have the necessary qualifications. Such men should be transferred to the marksman company and trained. Trying to train the remainder is only a waste of ammunition.

A company of 120 men in simple rank occupies about 100 yards. A platoon of such a company deployed at one-yard intervals, will also occupy about 100 yards. And the battalion of four companies—480 men—will occupy 100 yards of the line of battle.

When the batteries of attack have got well to work on the business of the second stage of battle, the men of the first platoon of marksmen find their way, singly or in squads, deliberately or by rushes, to the 800-yard range, where they establish themselves behind cover at one yard intervals. (It is assumed that every soldier carries an intrenching tool.) The second platoon of marksmen establishes itself in a similar manner at the 1,000-yard range, and directly behind the first platoon.

Both open fire. The firing will be deliberate, accurate, scientific sharp-shooting.

While the firing continues, the marksmen of the first platoon transfer themselves, by individual rushes, to the 600-yard range; and the second platoon moves forward to and occupies the 800-yard shelters. The first company of line infantry moves up to and occupies the covered position at the 1,000-yard range. Line troops never fire at long ranges. The first duty of a soldier on reaching a new position in the attack is, to intrench. These rules are general.

Again, the marksmen of the first platoon advance as before and establish themselves at the 500-yard range. The second platoon closes to the 600-yard shelters; and the first platoon of the first line company transfers itself forward by squad rushes to the 800-yard position.

The next rush carries the first platoon of marksmen to the 400-yard range; the second platoon to the 500-yard; the first platoon of the first line company to the 600-yard; and the second to the 800-yard ranges. The third line company moves into position at 1,000 yards.

The marksmen are now well posted for effective work. They advance no nearer the enemy during the attack. Their fire, although less in volume, should be more effective than that of the whole battalion firing indiscriminately according to the blaze-away tactics. It is fair to assume, then, that the fire of the enemy's infantry will be seriously disturbed and well kept down during the advance. It is of great importance that the enemy be taught to respect the assailant's fire. For this purpose the marksmen's fire at this stage of the attack should be allowed to operate for some time before the advance is resumed.

The advance beyond the 400-yard range is by the line infantry alone. When the proper moment has arrived, the first platoon of the first line company advances by individual rushes, and occupies successively the intervals in the second and first lines of marksmen. The second platoon follows, and occupies the intervals in the second line of marksmen. The second line company occupies the 600- and 800-yard shelters; and the third, as reserve, mans position at 1,000 yards.

Under cover of the marksmen's fire the first platoon of the first line company advances by squad rushes, and establishes itself at the 300-yard range. The second platoon follows the

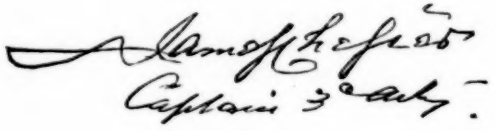
movement and occupies the intervals in the first line of marksmen; and all the line platoons in rear advance one stage.

The further advance of the line infantry is by squad rushes of 50 yards, the rear platoons closing up as vacancies are formed, until the leading platoon reaches a position within 100 yards of the enemy. This is well intrenched and by degrees the second platoon joins the first, and the whole of the first line company is assembled behind the 100-yard trench; the whole of the second behind that at 150 yards; and the whole of the third at the 200. The marksmen company now becomes the reserve, and the line companies rest, and get ready for the assault. The marksmen's fire is steadily maintained during the advance.

The point of assault is thus reached, and while the loss may, and perhaps must, be considerable, it will be much less than if the assailants had not resorted to intrenchments. Besides, the three assaulting companies are comparatively fresh—they have done no firing,—and the marksmen, who by this time have the range accurately, are the strongest kind of a reserve.

The assault and subsequent mêlée follow in due course. With them battle intrenchments have no concern. They have fulfilled their functions in lessening the losses of the advance, and making it possible to bring the assaulting force within assaulting distance.

An attack by intrenchments will be necessarily slow. Dash and enthusiasm are out of place in front of a line of breech-loaders covered by intrenchments. The distance to be traversed is too great. The attack must be methodical and slow. Enthusiasm and dash must be saved for the assault. Our men must be taught the use of the spade, and our non-commissioned officers must learn to lead. War is a new game, and cannot be successfully played by old rules.



SMALL-ARMS AMMUNITION SUPPLY.

By FIRST-LIEUT. GEORGE S. WILSON,
TWELFTH INFANTRY.

THE problem of ammunition supply to meet the heavy demands of breech-loading arms has received a great deal of attention in all European armies. Means of insuring the supply to the army, and of handling cartridges, from the time they leave the depots until fired at the enemy, have been worked out in detail and embodied in regulations. The commander, from the company to the head of the army, understands in advance what will be furnished, and the action necessary on his part to supply his men with cartridges.

With us it would appear that the subject has been neglected. Breech-loading arms have been in our hands well on to twenty years. All military men recognize the fact that the successful use of this arm depends upon means of supplying ammunition in quantities far excelling any former experience of ours, yet should war come to-morrow, there would not be a commander, high or low, who could refer to a regulation, or official suggestion, governing either the quantity, the transport, or the handling of our cartridges.

The question thus being an open one, I will present for consideration a hasty review of the different systems of ammunition supply in armies where the subject has received that attention which its importance deserves; and at the same time I will offer a few suggestions applicable to our own service.

For convenience of discussion the subject may be treated under three heads:

First.—The total supply.

Second.—The wagon transport.

Third.—Service of cartridges to the fighting line, and the quantity carried by the soldier.

In a paper entitled "The Supply of Ammunition to Infantry on the Field of Battle," written by an officer of the French Army, and republished in our "Ordnance Notes," * is this table:

Manner in which the ammunition is carried.	No. of cartridges carried by enlisted men.						Remarks.
	France.	Germany.	Austria.	Italy.	Russia.	Switzerland.	
By the soldier	78	80	70	88	60	100	*By baggage wagon. Does not follow Company to battle.
Regimental wagons . .	18.1	19.2	52.5		60	35	
Or packs		*11.5					
Total. First supply for fighting line	96.1	99.2 110.7	122.5	88	120	135	
By Division Park . .	46.4	20	22.5	50	60	35	
Total supply for field of battle	142.5	130	145	138	180	170	
Corps Parks	31.5		6x	50		30	x Plus 22.5 by Reserve for the Army.

It will be noticed that the total of small-arms ammunition for the field of battle reaches the maximum in the Russian army, while Germany provides the smallest supply.

The army corps parks being in the nature of a reserve supply, their consideration will be left out of this paper, the object of which is to discuss the supply for the field of battle, which is at all times with the troops, ready for use. This supply commences in the soldier's pouch, and ends in the divisional train.

The writer who furnished the table just read, referring to it, says: "Must we then conclude that this supply is absolutely sufficient for the exigencies of modern combat? Such (he continues) is not the opinion expressed by the commission on field firing, which assembled at Châlons in 1878, and according to which every man should have at his disposal one hundred rounds, exclusive of those in the battalion wagons and other ammunition columns. Nor is such the deduction we should draw from a study of accomplished facts in the Eastern war of 1877–78, for in the Russian army the consumption of ammunition during that campaign frequently reached a higher figure even than that named by the Châlons commission, while in the Ottoman army it attained proportions truly extraordinary * * * certain battalions being furnished five hundred and seventy rounds per man." Again (from the same writer), "experimental firings of

* Most of the data in this paper is taken from the "Ordnance Notes," published by the Chief of Ordnance at Washington.

the 11th German Army Corps showed that an average of 100 to 120 cartridges per man was fired in three or four hours' time, firing with the utmost deliberation, and the greatest economy of ammunition."

In the English army, according to Sir Garnet Wolseley, the ammunition supply is:

In possession of troops	rounds, 70
Regtl. reserve in wagons	" 30
Field " " " with division	" 30
" " " " " corps	" 30
Grand depots and intermediate reserves	" 320
Making a total provision of	" 480

Speaking of ammunition which should be on hand for British troops in their irregular service in India and other quarters of the globe, where English arms sustain English commerce, Wolseley sums the matter up by the conclusion that "special calculations must be made in each instance to meet the peculiar circumstances of the case." With a simple reference to this sentence, I will dismiss from consideration our own irregular warfare against the Indians on the Plains and among the mountains of the West.

So far as actual expenditure of ammunition in battle is concerned, some data may be introduced, but it is proper to remark that all authorities agree that calculations for supply should not be based on any general average of expenditure in battle. The reason is clear; a great portion of troops in battle may not fire a shot, but as no human foresight can determine which battalion will, and which will not, become hotly engaged, the only safe estimate of supply should be proportioned to the possibilities of the tactical unit. Thus, in the 1st Prussian Army which attacked the Austrians on the Bestritz River at 8.30 A.M., in July, 1866, and remained heavily engaged all day, the average expenditure was only 12 rounds per man, though in one regiment it rose to 72 rounds, and in the case of two companies to 80. The 2d division of the French Imperial Guards, at Rezonville, fired an average of 20 rounds. The French Army of Metz expended only 25 rounds per man, and in the same campaign the 12th German Army Corps expended in the various battles from 6 to 15 rounds per man. But on the other hand, at Plevna, some Turkish battalions fired over 150 rounds per man.

The United States has had no war experience with breech-

loading arms, therefore it is to those countries that have had such experience that we should look for instruction as to the supply of ammunition we would need when war comes. What, then, is the lesson which the experiences of the armies of Europe teach us? In my opinion it is, that an American army going to war should have at hand more ammunition than any other army of civilized countries.

In demonstration of this proposition, look at the Russian, the Turk, and the German. The Russians have campaigned in a rough country of great extent and bad roads, and know the value of being, in a measure, independent of reserve depots, and they carry with the troops more ammunition than is provided for any other army of Europe, except the Turkish. With us, condition of country and of roads would be somewhat similar. The Turkish army which fought the Russians, largely made up of raw levies, poorly organized, and wanting in discipline, expended enormous quantities of ammunition; and, it may be remarked, owe much of their temporary successes to the fact of being so well supplied in that respect.

In lack of discipline and defect of organization, we should not shrink from comparing ourselves, in a certain degree, with the Turk. On the other hand, Germany, a master in the details of the art of war, provides the smallest number of cartridges. But for us to follow Germany in this respect, would be to fly in the face of the true deduction to be drawn from a comparison of her ammunition supply with that of other countries.

German officers are, perhaps, the best trained in the world, while the discipline of their army is the development of generations of military service and subordination. In such an army, control of men, and of their every action, reaches the highest possibility, and no cartridges need be wasted or uselessly fired. With us these conditions are reversed. Our national characteristics of self-assertion and of individuality of thought and action —our lack of training, and lack of inherited discipline, our habits of wastefulness—all go to make up a soldier who would consume ammunition only equalled in quantity by the punishment he would inflict on an enemy if we but keep his pouches filled. Again, could we hold as large a proportion of the force in reserve as do the Germans? Would not the American soldier, when brought under the enemy's guns, demand to be placed where he could return the fire? If so, theoretical tactics should yield to

the national temperament, and more cartridges be forthcoming. One other point, and I will pass to another phase of my subject. Long-range firing is still being discussed by military men, the question mainly hinging on the ammunition supply. It has many advocates and able opponents. I will not quote from these discussions. All remember how effective was the long-range fire of the Turks, and the serious effect it had on the Russians at from 1,200 to 2,000 yards, and even greater distances. With us I think the first battle would settle the question in favor of long-range firing. I predict that the range of our firing will be determined only by the range of our rifles. If for no other reason, I should advocate it as a mere matter of diversion. Although over twenty years have passed since I have heard the whistle of a hostile bullet in regular warfare, I still have most unpleasant recollections of situations where we were placed subject to the enemy's fire without being able to return it. No situation in which a soldier is likely to be placed is more trying to his courage. Nothing causes a greater sense of helplessness. Under such circumstances long-range firing could be made a sustaining power to the soldier's fortitude. This new phase of warfare would also consume additional cartridges.

In view of all these demands, and looking to the experiences of the armies of Europe, I would advocate a supply of at least two hundred rounds of small-arms ammunition per man, or twenty rounds more than is provided for any army in Europe.

The subject of wagon transportation of ammunition now claims attention. In the French army a 4-horse ammunition-wagon is attached to each battalion. It is provided with 3 boxes, each divided into two unequal parts. The cartridges are enclosed in canvas-covered bundles furnished with a handle, containing 28 packages of 6 cartridges each. The load of each wagon is therefore 18,144 rounds,—about 2,000 pounds in weight. Each of these boxes is provided with 12 canvas wallets for carrying ammunition to the fighting line. The divisional train consists of thirty-two 4-horse ammunition-wagons of the same capacity and pattern of the battalion wagons, a forge, 4 horses; a battery wagon, 4 horses; a forge wagon, 6 horses; and three commissary wagons, 2 horses. The personnel of this train is: 1 second captain, 2 lieutenants, 1 quartermaster-in-chief, and 7 other quartermasters (one of whom is an artificer), 1 quartermaster-sergeant, 6 corporals, 1 farrier, 2 shoeing-smiths, 2 smiths, 2 carpenters, 6

artificers, 2 collar makers, 2 trumpeters, and about 150 drivers. If this is a sample of the force the French require to manage a train of thirty-eight wagons, we have nothing to learn from them in that business. On this side of the Atlantic the most reckless general officer would hardly assume the moral responsibility of enveloping one small team in the double and twisted profanity of four drivers, nor would it be necessary. In our language one teamster may generally be relied upon to swear six average Kentucky mules through to the end of the march. But the French seem to be satisfied; for my authority says this train was generally able to follow the troops wherever they went.

In the German army the company baggage-wagon carries 2,880 cartridges. As a rule, it does not follow the company to the battle-ground, and unless the cartridges are previously distributed, this supply is not readily available. There is one battalion ammunition-wagon made of iron and drawn by six horses, which carries 19,200 rounds. The divisional small-arms ammunition-train consists of 21 wagons (as above) for cartridges, 1 battery wagon, 1 forge, and 1 baggage wagon. The train is divided into parts, but for what purpose I have not been able to learn. Why these six-horse wagons carry so small a load—19,200 rounds—is not explained.

The Austrian battalion has ten 4-horse ammunition-wagons, containing each 21,000 cartridges. The divisional train consists of about 200 men, 200 horses, and 39 wagons. It carries 22.5 cartridges for each infantry soldier and a supply of artillery ammunition. This is another case of each driver having a horse to himself. The Russians have with each company a wagon or cart holding 11,340 cartridges. It follows the company when the latter is detached; at other times the wagons are grouped by battalions. The divisional train for infantry ammunition has 22 wagons and carries 60 rounds per man. In mountainous countries this train did not give satisfaction, and a number of Russian military men advocate a lighter wagon and the use of pack-animals. The Turks use two-wheeled carts, which in their late war accompanied them on the march when they could do so, but in difficult countries packs were found necessary. A battalion has 24 to 30 of these animals, each carrying two boxes of 1,000 rounds. In the English army ammunition is carried with the battalion in 3 two-horse carts, each containing 9,600 rounds. The divisional train carries 30 rounds per man. Provision for

pack-animals is made where wagons cannot be used, as is the case in many places where the British army operates. In some instances they use mules, others camels, and in the Bori country men (natives of the country) were used for the purpose. In all of these armies trains move with their commands, unless ordered otherwise for the time being.

In looking over the system of ammunition transport in these armies, there are some points it would be well to remember, but in matters of transportation we may safely rely upon our own knowledge and resources, to excel in good results, any management which requires an average of five men to the team to move but indifferently loaded trains on good roads. The proportion of ammunition between the battalion and divisional trains is of interest, because the former is the supply for the emergency of sudden battle, while the latter is more in the nature of a reserve.

I like the Russian plan of a large supply ever present with the troops.

In our service I would suggest 20 rounds per man in the company baggage-wagon, 70 in battalion wagons, and 70 in divisional train. Assuming that our infantry battalions will be of 4 companies of 100 rifles each, then, 2,000 rounds would be in the company baggage-wagon, and 28,000 rounds—or, just one wagon-load with the battalion train. The German plan of a few cartridges in the company baggage-wagon is peculiarly applicable to a system of which I shall speak further on.

A distinctive color for wagons of each kind of ammunition, infantry, cavalry, and artillery, should not fail of adoption. Not merely letters and marks, but the whole wagon from running gear to canvas cover, should have its color to correspond to the trimmings of the arm to which it pertains. On the other hand, the Germans and the Austrians require a battalion wagon on becoming empty to go back to the divisional train; the former to replenish its boxes with ammunition, and the latter to hitch its horses to a full wagon, and then return to the engaged troops. Why do this at the expense of twice the time, and double risk of accident? Why not at once order up a divisional wagon by fast courier, or field telegraph, leaving empty wagons to go back to the divisional train to stay there until the battle is ended. In furtherance of this idea all infantry ammunition wagons should be of the same pattern, and some liberal system adopted of messing train men and foraging animals where-

ever they might be found on duty. Although in some quarters there is objection to a teamster carrying his kit on his own wagon, I see none. In addition to his kit he should have on his wagon, when battle is impending, at least two days rations, and two days' short forage for his teams. This would lessen the ammunition load about 2,000 rounds, but in the end there would be compensating advantages. The ammunition train thus made up, wagons would be interchangeable—that is, battalion wagons when emptied could go to the divisional train, and loaded ones from the latter take their place with the battalion. The emergency over, all could be straightened out at leisure. With this plan, the temporary mixing of trains would not create confusion, while the distribution of ammunition to points most needing it, would be facilitated.

We should stick to our six-mule teams, at least until our country roads are replaced by better ones. The heavy lumbering wagon of the late war, however, should not be allowed to show itself again. An average load of ammunition for a six-mule team would be from 25,000 to 30,000 rounds.

Good, well-equipped, and well-managed pack-mules could carry 2,000 rounds each, against 4,000 to 5,000 per animal in team. The use of packs would more than double the forage consumption, and the personnel of transportation, and would cause the entire ammunition supply to be handled twice a day, at the expense of no little time, night and morning. Therefore, if roads permit wagons, packs should not be used. But an auxiliary pack-train should be on hand some place in the rear to be taken up in case of need. And it is of the utmost importance that this train be well manned, under experienced boss packers, and in all its appointments splendidly equipped. Nothing pertaining to field transportation is so imperatively demanded, as experience and competency in the use of pack-animals.

In regard to the disposition of trains on the march, circumstances should govern.

The system of serving ammunition to the fighting line in European armies may be summarized as follows: Battalion wagons follow their respective commands to a sheltered spot not far to the rear of the line, each placed by the battalion commander, and controlled by him. Company commanders of their own action draw on this wagon, and in the same way battalion commanders draw on the divisional train. After exhausting their own supply, troops may draw on other wagons.

No formal demand nor receipt is exacted. With the Russians, who have a wagon to each company, but one to the battalion follows; the others are grouped by battalions farther to the rear. Flags by day and lanterns by night are placed a short distance to one side to denote the location of the wagons, but not so as to discover them to the enemy.

Communication is kept up between the wagons and the troops by mounted orderlies. To overlook these simple and common-sense precautions might cause the loss of a battle. On going into battle, the Austrians give out ten rounds per man from the battalion wagons. At the begining of an engagement a party of two to four men is detailed in each company to go to the wagon, where they divest themselves of equipments, and with the wallets and bags provided for the purpose, and kept with the wagons, they commence carrying cartridges to their companies. The German soldier carries 500 rounds at a load, the Frenchman 360. If the distance be considerable, say 1,000 yards, 500 rounds is too heavy a load. The Germans hand the cartridges to the fighting men, but the Austrians empty them on the ground for each man to help himself.

Except on the defensive, under cover, I should think the latter plan faulty, if not disastrous. In most armies men are specially trained for this duty, but the Austrian captain may send musicians without reference to their special fitness. For this all-important duty none but the best of men should be selected, and the most reliable and courageous non-commissioned officer in the company should be in charge of the party. If additional force is needed to fetch ammunition, it is taken from the supports or reserves, never from the fighting line. The Turks on the defensive placed boxes of cartridges along the intrenchments. Pack-mules were used by them to deliver cartridges to the skirmish line, and they performed the duty well.

In this outline description I have tried to present the prominent features of cartridge-service in the German, French, Austrian, Russian, and Turkish armies. Turning to our own service I don't see how we could do better than adopt substantially the same means of distribution. I should think, however, that at this point the mule might step in and assume that importance for which he is so justly celebrated in our army. The war of 1861–65 demonstrated the fondness of the American general and the American soldier for temporary intrenchments on the

field of pitched battle. With modern arms cover is still more desirable, and the next war will probably bring into use regular intrenching tools as part of the equipment of a company of infantry. Not a mere makeshift, such as a trowel-bayonet, for instance, but serviceable spades and picks. Hence, I say, these tools will be a part of the equipment of a company,—not of the individual soldier. Means of transportation for these tools other than the soldiers' legs should be provided, and of a nature that would insure their presence ever with the company. Pack-animals would answer these simple but important requirements. Two mules could carry the intrenching tools for a company of one hundred men. When the tools would be called into use, ammunition would be required, and the mules relieved of one duty would stand ready for the other. Thus, incidentally and without increase of forage supply or impedimenta, each company might have the services of a friend who, if properly rigged, could be of material help in delivering cartridges to the fighting line. For pack rigging I would suggest wool-lined panniers to receive the loose packages of cartridges, with cases made of heavy leather to fit in the panniers for the spades and picks to rest in. In unloading the tools the cases would be taken out, leaving the panniers ready for instant use with cartridges.

The soldiers' cartridge equipment in European armies, consisting of a pouch, carries about half of his personal supply. The remaining half—30 to 40 rounds—is in the knapsack. English infantrymen have a ball bag, which habitually carries 10 rounds, but holds 40 when required. In taking extraordinary supply of cartridges, the German soldier puts packets in his haversack, and pockets and buttons them inside of his blouse. This is in addition to his knapsack supply.

The objections against the knapsack as a cartridge receptacle are manifest. General Ingalls estimated that 25 per cent. of the Army of the Potomac threw their knapsacks away, while in Sherman's army not half of 25 per cent. of the infantry retained them. Again, it would often be necessary to order that they be left behind, and, in that case, the ammunition which would of course be taken from them, would be in the hands of the soldiers without means on their part of taking care of it. But in the absence of these objections there remains the more serious difficulty of quickly getting at the supply in time of need. The use of the haversack for cartridges is condemned. Soldiers must

eat, and that article of equipment should be sacred to its legitimate use. The English ball-bag may in a measure supply the want, but it has the fatal objection of being an extra piece not in constant use, yet to be constantly carried and cared for, that it may be on hand at some future time, for possible use in battle. Only a high state of discipline, and the never-ceasing watchfulness of officers would prevent men from throwing such things away. Officers of experience with volunteers will appreciate the force of this objection. The fewer pieces a soldier has to carry, the better condition is he in to march and fight. To get over the knapsack difficulty the French have experimented with an equipment consisting of four pouches, of twenty-four cartridges each—two on the waist belt and two suspended on the shoulder-blades by a system of straps and braces. It is cumbersome and complicated. To get at the reserve pouches, straps and braces have to be unfastened and hooked up to prevent their loss, and finally the knapsack (with no blanket rolls) has to be taken off before the pouches can be replaced on the back.

In dwelling, as I have, on the demerits of the universally accepted mode of loading a soldier with his battle supply of cartridges, I have done but little more than condense what has been much more fully and better expressed by distinguished military men in this country and Europe. The whole thing is admitted to be unsatisfactory and inadequate to the necessities of the breech-loader, and the practice is only continued because no better plan has yet been proposed.

A study of the subject only confirms the conclusions which military men have deduced from experience and observation, and which may be summarized in few words. Breech-loading arms demand large quantities of ammunition. Celerity of movement require light marching loads on soldiers. Cartridges should be independent of other equipment. It is of the first importance to secure the best means of quickly augmenting the supply of ammunition at the beginning, and of replenishing it during the progress of battle. Cartridges should be in convenient shape for handling.

I have devised a method which I think satisfies these demands. It begins at the armory in packing the cartridges. as follows: A strip of light cotton-cloth, $7\frac{1}{2}$ x 22 inches; near the middle, running from end to end, sew a strip of the same material $1\frac{1}{2}$ inches wide, and provided with 20 loops $\frac{1}{2}$ inch apart, for individual cartridges. Pack the cartridges in the loops. Fold the top edge, or flap, of the wide strip over the heads of the

cartridges, bring it down, and stitch it to the opposite edge at the ends and between every second and third bullet. This flap secures the cartridges in the loops; to get at them, break the stitching, exposing a few at a time. To each end of this "packet" securely sew a strip of the same material 2 x 25 inches. The other ends of these strips securely sewed together, or, use one strip 48 inches long instead of the two. All ammunition to be kept up in these packets, instead of in the paper case as at present. In this shape the cartridges go to the soldier convenient for instant use. He takes the packets, swings them over either shoulder "shot-pouch fashion," or ties them around the waist, over the permanent belt, and is ready to march or fight. When emptied in battle the packet is thoown away. The packet is not designed as an accoutrement for the nominal supply of cartridges on the soldier, but as a means of dispensing altogether with accoutrements and makeshifts for the battle supply, and to facilitate the handling of cartridges.

No resort to knapsacks, haversacks, blanket-rolls, or other makeshifts necessary—no special accoutrement to add to the soldiers' load for months before needed, and which at best is not as convenient as this simple packet, which is practically without weight or bulk, and whose carrying capacity is limited only by the weight of cartridges a soldier could march under. No wallets and bags needed for distribution from the wagons to the line of battle, such as the French have thirty-six of to the wagon, and the English and German nearly as many.

The advantages of the packet extend to all phases of cartridge handling, but perhaps none would appreciate it more than the man who, when hotly engaged, should receive from the ammunition party one or more, which he at once slips over his head, and his cartridges are safe, and more easily got at than if in the box or belt. Contrast his condition with the man, similarly situated, who should have two or three of the present paper cases of cartridges put into his hands.

To supply more ammunition for battle, and at the same time put a less quantity on the person of the soldier while on the march than is done in other countries, may seem paradoxical. But I believe that to be the true policy. Celerity of movement is so potent a factor of success in war, that our study should be how to sustain the minimum number of cartridges on the soldier—not the maximum. Stonewall Jackson had the genius of using men's legs, and he was the scourger of the Army of the

Potomac. I would stick to old traditions, and fix the soldier's marching load of cartridges at forty rounds.

To meet this condition of so small a supply of cartridges on the soldier, it is of the first importance to provide the best obtainable expedient for quickly handing him his battle supply from the wagons, and in a shape to enable him to take care of it, and have it at all times convenient for use. I think this packet meets these requirements. To anticipate some of the objections which may suggest themselves against the proposed system.

First (which really includes every thing), would it answer the purposes for which it is designed? Actual experience alone can conclusively answer this question. To say that it is worthy of trial is the utmost that should be said of any new and untried device. Second, its durability; made of common cotton-cloth of the strength of goods in a shirt, the packet would stand hard usage in service for any length of time that extraordinary supply of ammunition would be needed in the hands of troops, say six or eight weeks. Third, the cost. The extra expense would be but trifling—not over one fourth of one cent per cartridge.

At this rate, 100,000 infantry could expend in a battle thirty rounds per man, and the extra expense chargeable to the packet would be but $7,500. But if the system would facilitate the handling of cartridges, cost is not properly an objection, for at best war is an expensive game, made doubly so no less by parsimony than by waste.

In conclusion, I think there are two conditions in themselves tending in opposite directions, which it should be the effort of military men to reconcile to each other. That is, a large battle-supply of ammunition, and a light marching-load on the soldier. In harmonizing these conditions, it is necessary, first, to divest the soldier of every thing useless or superfluous.

And in this connection, it may be proper to fire a few interrogation points at a questionable piece of impedimenta which perhaps it were better to relegate to a position of rest alongside that friend of its youth, the old flint-lock musket. If its days of usefulness are really gone, we need its place for cartridges. I refer to the bayonet. Why do we keep it? Is it because it has kept abreast of the breech-loader and the machine-gun? Or is it sustained at the soldier's side by a sentimental regard for its past services? We are told that it is still formidable. Where, when, and how? You can't convict a man of murder before you find the corpse. That is a principle of law. Then why allow the

bayonet to revel in the reputation of a man killed, and no corpse in sight? The effectiveness of a weapon is determined by the nature of its opponent. With breech-loaders, long range, and open ranks, how does the bayonet stand? The moral effect, it is claimed. That is well enough; moral effect may be tangible power, if allowed to have its own way. But when we reflect that the bayonet displaces, by actual weight, eleven cartridges, and by extra inconvenience, at least four more, I contend that these fifteen metallic cartridges could shoot the phantom of moral effect to death.

The infantry is now recognized as the real power of an army. How did it gain this position? By prodding men to death with a bayonet, or by shooting them? With breech-loaders, if the infantry maintains its place, every means must be used of solving the important problem of ammunition supply. A soldier is loaded with all the cartridges he can march under. Throw the bayonet away, and he could take fifteen more. Is it remembered what less than fifteen cartridges per man did in the hands of the Germans in July, 1866? They defeated and humiliated one of the great powers of Europe. The bayonet, too, was there on that bloody field of Iodowa, and yet, when the battle was ended, of all the 27,000 men who lay dead or wounded, not one could it claim as its victim. What does the bayonet cost an army? I do not know, but here are some of the figures for a twelve-months' war, with an army of 500,000 men. It at once and continuously crowds 7,500,000 cartridges out of the soldiers' pouches. It sends this ammunition miles to the rear, where it imposes the expense, and a hundred-fold worse, the impedimenta of over 600 wagons and 4,000 animals, including the furnishing of the extra forage and supplies involved. At this rate, the animal forage consumption chargeable solely to the bayonet, and which would tax the resources of transportation and encumber the roads, would be over 33,000,000 pounds, or more than 11,000 wagon-loads. If the fighting power of the bayonet is a compensation for all this, it should be retained. On the other hand, if the balance be against it, then the bayonet should be thrown away, and its place filled with cartridges.

Gen. S. Wilcox
1st Lieut. 12th Inft.

MOSES AND THE EXODUS.

By CAPTAIN GEORGE F. PRICE,
Fifth Cavalry.

On the east side of the territory of Moab passed the Israelites on their journey from Egypt to Canaan; up from the plain of Moab unto the mountain of Nebo, to the top of Pisgah, went Moses, and therefrom viewed the promised land.

As we study the now accepted map of that journey, the question naturally arises: Why did not Moses march his people by the more direct route through the land of the Philistines, thus affording them a comparatively easy and much shorter journey?

The reason given in sacred history for not doing so is, lest peradventure the people repent when they see war and they return to Egypt; so they were led through the way of the wilderness of the Red Sea, crossing that body of water near its northern extremity.

The Exodus is among the most notable of historical events. It has been truthfully written that we can only guess the steps by which our ancestors passed from Central Asia into Europe. We have learned through the translations of Sanskrit literature that the present European race is, in its origin, identified with and belongs to a primitive Asiatic stock. We have clearly proved to us an order of progress and civilization in India as old as that of China, and rivalling the antiquity of Egypt. We read the history of the latter by Champollion's renderings of hieroglyphic inscriptions, and we have the discoveries at Nineveh made by Botta in 1843–45, and by Layard in 1845–50, which inform us of events in the Assyrian and Babylonian empires 2,800 B.C. These confirm beyond all reasonable grounds of dispute many historical facts that are narrated in the Hebrew scriptures.

The civilization of the Toltecs and Aztecs, the ancient builders of this continent, whose ruins indicate once cities as large as

those of Assyria, and whose hieroglyphic and symbolic records are engraved on immense bowlders and on the sheer rock-walls of mountain gorges, is as yet lost in the night of ages. The present study of Egyptian and Assyrian writings informs us of events in dynasties contemporaneous with Abraham and Solomon. In the fulness of time the history of the ancient ruins and the hieroglyphic and symbolic records of this continent will be made known, and now apparently impenetrable mysteries will disappear before the strong, clear light of intelligent research. We will yet read the wonderful story of the Toltecs, Aztecs, and Indians of the present age, all of whom had, and have, in daily use many of the teachings and customs of the Mosaic dispensation.

The story of the Exodus is found everywhere in the history and literature of the Hebrew race, and we have the records so complete, that, after the lapse of thirty-five centuries, we may, it is now claimed, trace upon our modern maps with few exceptions the line of march more accurately than we can that of Hannibal from Spain into Italy.

Moses led the Israelites, during forty years of wanderings, because he knew that their previous condition of servitude, aggregating four hundred and thirty years, had unfitted them to exercise wisely their newly-acquired civil rights, or to discharge properly their military duties, and that he must wait till the males of a generation not then born had reached a vigorous manhood, training, disciplining, and organizing them before he could venture to attempt the conquest of Canaan, and yet, when the Israelites started from Egypt, they cherished, with other delusions, the fallacy that every male more than twenty years old was a soldier. Moses was their legislator and the founder of their religion, belonging to the tribe of Levi. He was for forty years an Egyptian; then for forty years he was an Arabian, and the keeper of the flocks of his father-in-law. At the age of eighty years he was called to the leadership of his own people, and retained control till his death forty years afterward; and when he passed away his eye was not dim nor his natural force abated.

A march of about two hundred miles, which unmolested could have been made under ordinary conditions in a few weeks, would have moved the Israelites from Rameses, where they rendezvoused, about sixty miles from the present Cairo, to Hebron, one of the oldest cities of the earth; but Moses first led them a

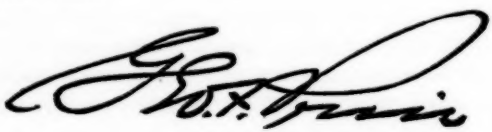
march of more than one thousand miles from Rameses, passing through Succoth to Ethano, thence to Sinai, thence to Ezion-Gaber, and thence to Kadesh; thereafter the Israelites made many other journeys, till, finally passing the borders of Edom and Moab, they arrived at Jericho.

Why Moses did not take the short route is shown both in sacred narrative and in the well-established fact that the short route passed through the Philistine country, where lived a powerful and warlike people, who were disciplined and equipped by a strong centralized government. An attempted march over the short route would have encountered resolute resistance, but Moses had military skill and sagacity to understand that his people, just released from abject bondage and without either a civil or a military organization, could not compel a passage through that country. Time was essential to organize them into an efficient fighting force; that they were then abject, dependent, easily alarmed, and lacking in courage, is shown in their great fear when Pharaoh pursued them, the often-expressed wish to return to Egypt, the murmurings against their leader, and rebellings against rightful authority: so they were marched directly away from Canaan and to Sinai, where they remained a long time perfecting an organization and establishing a theocracy. Here the Amalekites failed in their fierce assault upon the Hebrew flank; here Jethro, the father-in-law of Moses, visited the people, and to him the leaders were indebted for the suggestion to teach laws and ordinances and to make rulers of thousands, of hundreds, of fifties, and of tens, and thus lighten the mental and physical labors that weighed so heavily upon the great leader.

After many journeys (sacred history records forty-two in all) Moses led the people to the frontier of Canaan and dispatched twelve scouts from Kadesh—one from each tribe and each a ruler—to enter and spy out the land; they returned after an absence of forty days and made a favorable report of the fertility of the soil (doubtless the abundance of water in that country made it appear to them as a promised land when compared with rainless Egypt), but the scouts also reported that the inhabitants lived in walled cities, and ten of the twelve declared that these were too strong to be carried by assaults; then the Israelites, tired of the long waiting and years of wanderings, proposed to depose Moses, elect a new captain, and return to Egyptian bondage;

they made an advance, not approved by Moses, and were defeated by the Amalekites and Canaanites and driven back to Hormah with great loss; after this disastrous defeat, the people remained at Kadesh for a long time, preparing themselves for the work and occupation intended for them. Finally, when all the details of their organization were completed, the great march of conquest was begun. Moses asked permission to pass through Edom and was refused; he at once retraced his steps to Mount Hor, almost half the distance to Sinai, and then, marching northward on the western side of the Dead Sea, struck fiercely and fatally at the enemy who attempted to obstruct his passage, defeated the Amorites, killed their King Sihon, and also killed Og, the king of Bashan. The Israelites, under the leadership of Joshua, then entered the valley of the Jordan and crossed the river at the ford El Mashra, opposite Jericho—one of the four fords to this day considered practicable for the crossing of an army,—invaded Canaan from the northeast, instead of from the southwest, which was the direct line of approach, and fought to a successful end an aggressive military campaign which, if a like one, under similar conditions, were accomplished at the present time, would win the admiration of the civilized earth. The results of these operations redeemed the promise of Moses that "the dukes of Edom shall be amazed; the mighty men of Moab trembling shall take hold upon them; all the inhabitants of Canaan shall melt away."

Moses and his successor, Joshua, fixed upon the objective point and marched toward it, not by the direct line of approach, it is true, because sometimes, as in this case, the direct line is the most difficult; therefore the march was made on the line having the fewest obstacles to overcome, never abandoning at any time the objective point to be reached. Yet a direct march of about two hundred miles from Rameses would have taken the Israelites to the centre of Canaan, but if a passage of the direct route had been attempted, history would have recorded a disastrous failure, and the promised land of Canaan would never have become the home of the Hebrew race.



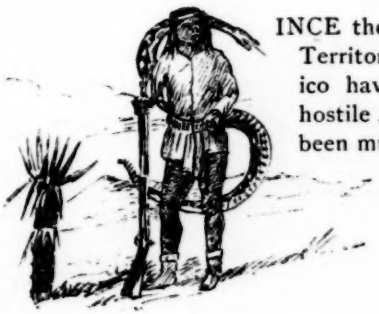
APACHE CAMPAIGN NOTES—'86.

By FIRST LIEUT. JAMES S. PETTIT,

First Infantry.

(*Illustrated by the Author.*)

I.



SINCE the 17th day of May, 1885, the Territories of Arizona and New Mexico have been raided by bands of hostile Apaches. Many citizens have been murdered and much stock stolen. To the old settlers, the terrible atrocities committed by these red demons are not new, as Cochise, Victorio Ju, Nana, and Geronimo have, in years past, broken from their reservations and, defying the troops, have murdered, robbed, and mutilated the miners and settlers who ventured, unprotected, into this region.

After hard campaigns, with much loss of life and at great expense to the Government, they have, in turn, been either killed or forced back to their reservations, to nurse their sullen discontent, and to cunningly lay by arms and ammunition until another opportunity should offer to satisfy their wild craving for the blood of the whites.

At the conference between Gen. Crook and the hostiles in March, of this year, neither Geronimo nor Chihuahua could give any reasonable excuses for taking to the war-path, which leaves us to infer that such a course must have been due to their bestial savage natures, and an inborn love of strife and bloodshed. It

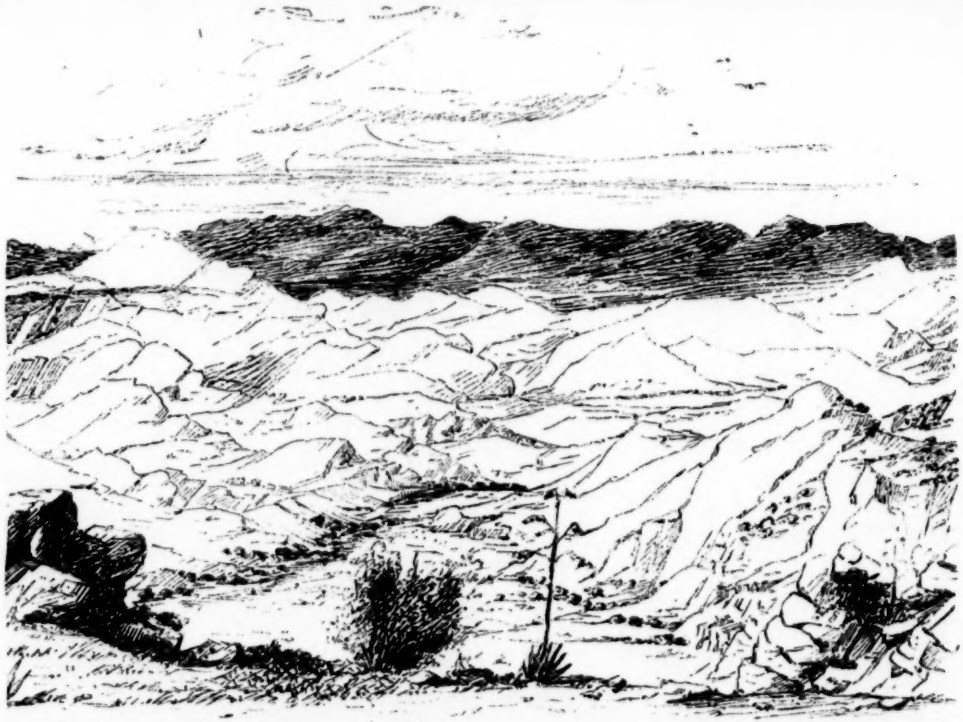
will be impossible to give any detailed account of the operations in the thirteen months we have been at war with these savages, suffice it to say that the 4th, 6th, 10th, and part of the 2d and 8th Regiments of Cavalry, with parts of the 1st, 8th, 10th, and 13th Infantry regiments and two hundred Indian scouts (or nearly one sixth of the entire army of the United States), have been in the field continuously, since the summer of '85, and at this writing (June 15th) we seem farther from the goal than ever. To say that nearly one sixth of our army has been pursuing between fifty and one hundred Apaches for over a year, and accomplished nothing, while it may be true, literally, is in the greatness

THE "GERONIMO FLAT"—ADJUTANT'S QUARTERS.

of the task before them no discredit either to the courage or zeal of the troops.

Those who have never travelled through this region, with its high mountain ranges, deep rocky cañons, and wide sandy plains, will fail to comprehend the trials, hardships, and annoyances which the troops are constantly required to undergo.

Fifteen miles on a New York turn-pike is only a delightful drive, but over "mal-pais" rocks and through stony gorges devoid of water it is a hard six hours' march, and very fatiguing, especially to the horses, which, perhaps, travelled forty or fifty miles the day previous, without grain-food and but scanty grass and poor water. The very smallness of the band of hostiles is greatly in their favor, as they have but little impedimenta and



A BELT OF INDIAN COUNTRY LOOKING ACROSS GUADALUPE CAÑON INTO MEXICO.

leave an illy-defined trail. When closely pressed by the troops they scatter like coveys of quail, and skulking through cañons or along the very highest ridges they meet again at some prearranged spot on the mountains. The country, from the Apache reservation to the heart of Sonora, is as familiar to them as Madison Square to an old New-Yorker. While they prefer to travel mounted, they can readily travel seventy-five to one hundred miles in twenty-four hours, on foot. Again, the information given to the troops by citizens is often untrustworthy and misleading. In June, '85, some companies of the 10th Cavalry were drawn into a march of many miles by a gambler who "stood in" with the telegraph operator at a little town; a message was sent to the commanding officer to the effect that the Indians had killed several men near the place, and were in

THE HELIOGRAPH.

the mountains near by. Upon arriving at the town it was learned that the telegram was a hoax to entice the soldiers, who had just been paid, into the neighborhood, in order that this "professional" might win their money. I have heard other officers tell of similar experiences. Such things are not encouraged by good citizens.

These are a few of the many difficulties and discouragements which continually surround our troops.

There are other difficulties incident to our service.

The supply of horses is totally inadequate to the demands of such severe work. Cavalry troops, which are allowed sixty-five men by law, are compelled to go into the field with from thirty-five to forty-five men all told. In action, from one third to one

fourth of this number must be employed, in holding the horses and pack-animals. So that a troop commander can inflict but little punishment on the hostiles when he strikes their camp, and may be considered as having done very well if he has simply held his ground. Again, there is a scarcity of officers, the heavy list of absentees, sick, and on the detached service, leaves but one officer with each of the troops, and on the skirmish line and with the stock to care for, there is ample work for the three officers of a troop.

Our officers are zealous and ambitious, and our men willing and courageous. It is only a question of time, the result is

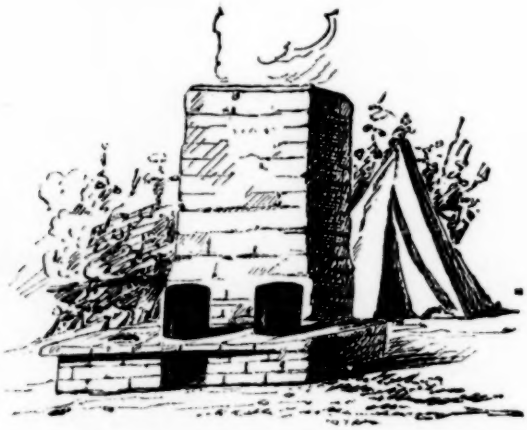
THE DEVIL'S DANCE.

certain. Many times in the history of the world have small determined bodies of men defied great nations, as did the pirates of the Mediterranean the great Roman Empire,—but all have met the same fate, and let us hope that in the end there may not be a single Chihuahua left in Arizona, to perpetuate the memories of these bloody tragedies, or to incite other tribes to the butchery of the citizens who bring their lives and fortunes to swell the growth and prosperity of our great West.

The little sketch on page 333 gives a fair idea of the country our troops are operating in. From foreground to background is about forty miles, a very long day's march, over a hilly, rocky trail. The mountains in rear are not far from the spot at which the conference was held in March of this year.

Our camps at times present picturesque and warlike scenes, with the troops of cavalry coming and going, companies of scouts lying around, and the great pack-trains coming in for supplies or rest.

As darkness comes on, the fire in the scouts' camp grows into greater brilliancy, and the thumping of a rude drum on the hands



THE KITCHEN.

of a medicine-man calls the braves to the dance. The medicine-man is "master of ceremonies." The dancers form a circle around the fire, and at the tappping of the drum the circle moves round and round as long as the drum is heard, all joining in the weird chanting. The devil's dance is well worth seeing. Stripped of all clothing, save a bandage around the loins, and with the head tied up in a dark cloth, and a long wooden sword in each hand, they leap, and roll, and go through wonderful muscular contortions for hours at a time. In common with our circuses, they have a *clown*, who is made *white* by covering him with flour. He carries a fire-brand in his hand, and his efforts were ludicrous imitations of the movements of the dancers. The scouts seem

to prefer their own "medicine-men" when seriously ill, and believe the weird singing and praying around the couch is more effective than the medicines dealt out by our camp "saw-bones."

They have many peculiar customs and ideas, but they have already been given to the public in a most entertaining volume, by an officer well-known in army circles, and of great experience.

II.

THE death of the gallant Crawford, who was so foully murdered, was the most unfortunate episode of the entire campaign. Unfortunate for the service at large, for it lost one of its bravest, noblest officers. Unfortunate for the campaign, for it occurred just as he had apparently accomplished the task of bringing the hostiles to terms. The Indians are naturally suspicious, but Capt. Crawford having been their agent for some years, they knew him well, and would have given him their confidence, and it is thought would have surrendered to him. After he was killed they would talk to no one but General Crook.

Shot down in broad daylight, in the uniform of the United States, and after two of his party who spoke Spanish well had repeatedly called out that they were friends. The taking of that precious life must and ever will be termed murder by all who are conversant with the facts; and these facts will not soon be forgotten by the officers of our Army.

The *unconditional surrender* of Geronimo could scarcely be called a *surrender*, as is implied in military parlance. He did not give up, either his arms, horses, ammunition, or money, and he was at the time well supplied. Nor was he at any time under *physical* restraint, but was free to go and come almost at will. He undoubtedly promised to come in in his own way, but he and the twenty braves left before they reached the United States.

A brute called a *man* started a grog-shop just inside of the Mexican line, and for some days before the conference sold "mescal" whisky and ammunition to the hostiles, until his place

was sacked by order of the commanding officer. He was a citizen of Arizona, and that he still lives is ample proof of the respect our officers have for law, even on Mexican soil.

The following questions have been discussed freely around the camp-fires, and from a purely military point of view the conclusions were generally agreed on :

First.—Are Indian scouts of great practical value, when operating by themselves, unsupported by regular troops. The records and the opinions of experienced officers seem to be largely in favor of a negative answer.

Second.—Are Indian scouts *loyal* and *energetic* when employed against their own people? Nature seems to answer this question at once, and decidedly, and the weight of opinion seems to coincide with her. The records at least do not show many cases in which scouts have inflicted serious punishment on their hostile brothers, cousins, etc. This may be due to the fact that as a rule they are very poor marksmen. Fortunately also the hostiles are not crack shots, for had they been skilled marksmen, at least two commands in the past year would have been well-nigh massacred.

This Apache war will go into history as another instance of what a few determined, active, cunning savages can do, when assisted by the vagaries of nature so freely spread over this country. And what odds! *fifty* to one *hundred* against *four thousand*, and although the end is certain, "it is not yet."

John S. Pettit

OUR EXCHANGES

THE EMPLOYMENT OF DYNAMITE AS A BURSTING CHARGE FOR ARTILLERY PROJECTILES.*

By Adolfo Carrasco.

Among the high explosives, that is to say those which exceeding the ordinary, such as the different war powders, are capable of producing very violent and powerful detonations, we will consider here only those of nitro-glycerine, or the dynamites; detaining ourselves only with the generic dynamite which is that of the inert silicious base, and mentioning, in passing, that of the explosive base called gum dynamite or explosive gelatine, since the others pertaining to these two classes, as well as those of the active base, are little known or little apposite for application to the problem proposed. And, as the properties of dynamite are derived from those of nitro-glycerine, it is necessary to say a few words about the latter.

Everybody has heard of the dangerous qualities of nitro-glycerine. It is extremely sensitive to shock, a small flask containing it being detonated by falling to the ground—the same occurring on account of a violent jerk—or strong pressure or friction. Although fire causes it to burn tranquilly, if the quantity is considerable it does not lose its explosive power; it may safely be rapidly heated to 200° or placed in contact with a very lively jet of heat. If it has nitric acid in excess or some has become free, as happens from its exposure to light or humidity, it proceeds to decompose, effecting it successively with increasing velocity until it detonates. Another property very interesting is that of freezing from 12° (Cent.)† downwards.

Dynamite, being nothing more than nitro-glycerine confined in the pores of a completely passive material, it is clear that its properties must be the same as those of nitro-glycerine, with the attenuation consequent upon finding itself divided into isolated particles, and upon the action, absorbent of heat and of shocks, exercised by the inert body; thus it is that it may better suffer blows and frictions, and its handling is relatively safe, provided always that it be well-made and conserved, and one works with due precaution. But as these requisites, and in particular the two first are very difficult of realization, it is not prudent to put much confidence in it.

Yet, with the conditions expressed, it detonates by the shock of metal and hard bodies and by every kind of powerful blow, among others that of a musket ball which

* Translated from the *Memorial de Artilleria*, Nov. 1885, by Major Geo. W. McKee, U. S. A.

† It freezes at 40° (F.) very nearly. (Trans.)

reaches it with much velocity: being so much the more sensible to these accidents as it is richer in nitro-glycerine and higher in temperature, and above all when enclosed in a resisting receptacle. At the Washington Navy Yard three dynamite shells were fired from a gun of eighty millimetres (3.15 in.) and, in spite of their carrying no fuses, they burst on striking the target (although with very little damage to it). In the open air a powerful hammer blow upon a small quantity causes only the portion struck to detonate; but the explosion is general if it take place in the bottom of a receptacle of whatever capacity.

It resists without alteration a gentle and progressive augmentation of heat. On contact with fire or through a rapid elevation of temperature to 200°, it only burns tranquilly; but this is in the open air, while in a resisting receptacle it detonates violently, as well as when the quantity of explosive is great.

Below 10° or 12° (Cent.) it freezes, the detonation then becoming difficult. In such a state it hardens and expands because of the crystallization of the nitro-glycerine on congealing, and the latter is able very easily to exude from its original lodgments, and to leave some of itself outside of them when it thaws; neither is this exudation impossible with the extreme heat of our climate? Also it evidences itself often through other causes, as, for instance, the small absorbent power of some of the silicious earths or an extreme dose of nitro-glycerine, without counting a bad execution of the final purification, which has for its object the exterior cleansing of the silicious grains from the nitro-glycerine which moistens them when the dynamite is prepared.

As three kinds of dynamite exist called No. 1, No. 2, and No. 3, containing 75, 50, and 30 per cent. of nitro-glycerine respectively, it follows that the exudation indicated will probably diminish the measures of these proportions and the potency of the explosive will be diminished in the same ratio; and, much exactness in it being necessary for the uses of war, we need not go below No. 1. Well, then, from the moment in which there is exudation of nitro-glycerine the latter entirely recovers its characteristic properties. Thus is shown the imprudence of heating dynamite to thaw it, and the high sensitiveness of this explosive in such a disposition; and the like up to the point of its being seen to detonate when a cartridge is cut with a hacked knife, or it is rammed into drill-holes.

Another bad quality of dynamite is based upon the spontaneous alteration of nitro-glycerine by light and humidity, from which results free nitric acid which may exist originally through bad manufacture, as has been said. This phenomenon creates an imminent predisposition to detonate with so much greater facility as the envelop containing it may be more resistant, and the developed gases may have less space to dilate in. On this account it is stronger packed than loose, and the keeping of it is dangerous at the temperature of summer if an active ventilation is not established (this again often opposes humidity), and for an equal reason it should be stored in receptacles of little consistency.

Dynamite even when congealed, is susceptible of being exploded through the influence of other explosives of the same material which manifest themselves at distances more or less great, according to its degree of sensitiveness, being able to explode thus divers cartridges in line; although not indefinitely, since the explosives diminish in intensity as they recede from the initial point.

The absolute density is 1.6; the relative 1.5.

We see that dynamite is very delicate; and if we endeavor to make it less sensitive by the incorporation of camphor or other bodies of like effect, it is at the expense of a great deal of energy; for which reason it is intended to substitute it (camphor) with other explosives, like the gum-dynamite or explosive gelatine, composed of nitro-glycerine and collodion or compressed gun-cotton.

This other explosive, when it contains four or five per cent. of camphor, needs for detonation an initial shock six times greater than dynamite properly speaking, and for the same reason it is less liable to be exploded by sympathy; but in alteration it is more difficult to provoke its action. Congelation does not diminish its energy but increases its sensitiveness, counteracting the good offices of the camphor. It burns in the air without explosion in small quantities; heated slowly it detonates at a little over 200°; water does not decompose it; it does not exude and is of greater effect than the better kind of dynamite. By prolonged exposure to temperatures which approach 40°, it loses its camphor and then detonates on shock; and, on the contrary, it loses its power of detonation when the camphor reaches 10 per cent. Notwithstanding, it may be on account of uniformity not having been followed in its manufacture, or for other causes, the results of experiments do not appear to have been satisfactory.

These remarks are indispensable preliminaries to the application of dynamite to projectiles as a bursting charge, since in such an act the explosive referred to will have to be very rich in nitro-glycerine; will be used compactly in receptacles of iron closed with resisting walls; will be immediately contiguous to fire and submitted to the sympathetic influence of explosions; exposed to blows and percussions of all kinds; and subjected to the causes which determine its decomposition. It is true that Industry consumes annually millions of kilogrammes (although not without repeated disastrous results), and that the military art employs it frequently, principally in the engineering branch; but all these applications are of a tranquil character and permit a method and care which are impossible in that of which we treat.

Its not being desirable for adoption in torpedo use by our navy, or others, serves as a confirmation. For the same reasons which have induced to establish these premises, we will commence now to speculate superficially upon the explosions, considering them under an equal point of view.

It is known that, in order to assure the explosion of dynamite, certain kinds of fulminating primers are necessary,—distinguished from the ordinary by being called detonators, and composed generally of a quantity of fulminate of mercury which ought not to be less than half a gramme (7.7 grs.) for dynamite of the first quality, and which should come up to one and a half (23 grs.) when it is frozen; and this is not simply to unite with the dynamite a porportional weight of unfrozen fulminate. It is from noticing that, when frozen, it detonates badly, greatly in proportion as its contact with the detonator is badly established. Explosive gelatine requires that a certain portion of dry compressed gun-cotton should be interposed in order that it may act directly upon the gelatine after it (the cotton) has received the action of the fulminate-detonator. And this complication of primer is another of the reasons why this explosive has not prevailed.

According to Berthellot, the explosion takes place through zones in the following manner: The released gases of the first inflamed coating (or of the detonator) precipitate themselves upon the immediate coating, exercising upon it a violent pressure which may be considered a blow, converting its living force into heat which evolves suddenly new gases; these shocking the contiguous coating, there is another transformation of living force into heat and a consequent evolvement of more gases, or, if you please, explosion, and so on successively. This manner of propagation presents phenomena analagous to those of the Sound Wave and has received the name of the Explosive Wave.

It is well know that the explosive wave, being in nitro-glycerine such as has been indicated, will experience in dynamite modifications on account of the interstices and silicious portions interposed, which form a kind of elastic cushion whose influence will vary also with the proportions of nitro-glycerine. The camphor alters the wave

because it lends a certain elasticity to the mass and compels the mutual dependence of the particles, and thus the shock is propagated to greater masses and expends itself partially in the work of dislocation.

It is equally conceded that the more violent the first shock the more lively will be the explosion, and that for the same stroke these explosions may be very variable in intensity—the same quantity of dynamite being able to produce very different effects according to the methods of initiating and of realizing the phenomenon. Bearing this in mind, at present we concede explosions of the first and second order, although the dividing point has not been well determined, the last being the stronger * and those which are needed for the bursting charges of projectiles. And we have seen in fact that, in order to burst a shell when the dynamite is thoroughly detonated by an explosion of the second order, the work will be performed by one half the charge that would be required in an explosion of the first order.

Instantaneous as the detonation may appear, it has been observed that it is far from being indifferent to the point whence it is initiated ; if we credit the experiment made with charges of dynamite suspended touching a vertical target of iron plates, they are much more damaged when the detonator is placed near the exterior part, or the point opposite the point of contact with the plates.

The local effect is estimated to be in the inverse ratio of the cube of the distance to the point of explosion ; if, at the distance of a centimetre, we estimate its work as 1,000, at ten centimetres it would only be one.

From what has been expressed, it is easy to reflect that, on a par with the probabilities of inopportune and disastrous explosions, there enter into the problem the difficulties of attaining timely detonations of convenient magnitude.

The principal features of the explosions having already been considered, it is convenient to know their practical effects relative to the application which we are considering. Commander Folger, in the United States of America, has made several experiments against a target of eleven one-inch plates united solidly to each other and to a strong backing of oak. The charges were contained in bags suspended leaning against the target and with the detonator on the outside part. The first ten detonations, with charges from five to seventy-five pounds of dynamite, caused no change in the target. An experiment with one hundred pounds produced an indent of two inches, greatest depth, and having a diameter of two feet, causing the exterior plate to loosen itself at the extremities and to separate from the one next to it, the contact being preserved perfectly in the others ; and, although the mass acquired a movement of translation of two inches, it returned of itself to its primitive position. In the other experiment another plate was arranged horizontally, touching the target with one of its edges, so as to represent a boat and the surface of the water, and a charge of seventy-five pounds of dynamite was placed in the dihedral angle, or water-line. The former impression was deepened an inch more and the edges of the plates were doubled or buckled outwards, but without being loosened or suffering other injuries more than the natural racking would leave in the vicinity of the shock. Also the target was repelled backwards two inches and likewise recovered its original position. One of the sides of the backing, which had several augur-holes corresponding to bolts used in other operations, was broken, the whole unhinging itself a little ; but it is to be observed that the target endured resisting a number of explosions which represented 440 pounds of dynamite. The horizontal target was crushed, destroying completely the frame which sustained it.

From these experiments Commander Folger deduces that a modern iron-clad will suffer nothing by an explosion in contact above the water, and little more at the line of

* The order of explosion seems to be a matter of convention.—TRANS.

flotation or water-line, with charges greater than one hundred pounds of dynamite ; and it is clear that it will be much less if the explosion manifests itself after the projectile rebounds and is at some distance from the vessel, as well as when it breaks before detonating, which would be equivalent to an explosion in the open air. A greater result would be obtained in case of penetration ; but, even supposing that detonation would not take place from the shock, which is contrary to experience,* we must discuss the explosive force with which the projectile should be endowed.

As a general rule investigators have abandoned penetration, contenting themselves with explosions of contact much less powerful, and all the published experiments agree with the preceding. During the years from 1874 to 1876 some were verified in Sweden modifying the results of others made before in America † by Capt. Lauer against plates of iron of three inches in thickness without any backing, from which he had deduced the formula :

$$W = d^2 b ;$$

in which *W* is the charge in pounds of dynamite No. 1, *d* the thickness of the plate in inches and *b* its breadth in feet,—the explosive being in a cylindrical cartridge of 1.5 x *d* diameter resting horizontally across the full width of the plate. The Scandinavian Commission employed for the charge cubiform boxes, diminishing thus the extension of contact, and deduced as a conclusion that over plates of five inches they were not able to obtain decisive results with charges less than seventy-seven pounds of Dynamite No. 1. They modified the formula, making :

$$W = 3.3\ d^2 ;$$

having adopted the co-efficient 3.3 as being the most appropriate for the width it is customary to give shield-plates, and depending on the condition that the thickness of the charge in a direction normal to the plate must be not less than once and a half the thickness of the iron. ‡

According to these principles, for a plate of five inches there result 82 pounds ; for one of ten there are 330 pounds ; and for that of twenty-four, of the Inflexible, 1,900 pounds ; all on the supposition that the detonation is verified above the surface of the water, or very little below it.

Although this formula is empirical and only applicable rigorously within the limits where we find it, various latter experiences, it appears, have caused it to be seen that it is acceptable generally. This being so, let us consider what shells, and consequently what guns, it would be necessary to employ when the projectiles of 100-ton guns have capacity for seventy-five pounds only. Notwithstanding, some experiments at Brest are cited in which the effects were more considerable, if indeed not so great as to do away with charges impossible in projectiles commonly used.

With these preliminaries we can now proceed to examine the more notable trials and experiments which have been made with dynamite shells.

Having in mind all the circumstances expressed, and to avoid the initial blow of the ordinary charge of powder, in the United States they have planned, or rather they have wished, to make a practical use of compressed air, from very ancient time adapted to the air-gun, although now relegated to laboratory experiments.

The piece called the compressed-air or pneumatic, and also dynamite, gun is a cylindrical tube of bronze without solder, one quarter of an inch thick, four inches in

* If it is intended to convey the idea that explosion on impact will be so instantaneous as to prevent a decided penetration, even when *uncamphorated* explosive gelatine is used, I think the author is undoubtedly in error.—TRANS.

† Austria ?—TRANS.

‡ See Paper on High Explosions, by Gen. H. L. Abbot, U. S. Engineer, in JOURNAL of MILITARY SERVICE INSTITUTION, June, 1885.—TRANS.

calibre, and forty feet in length fitted to a frame or stock of steel with trunnions. This species of carriage is mounted in a support gyrating over a foundation pedestal, and in such a manner that it may easily receive any desired inclination. The air is directed from a receiver to the gun by a conductor, which, passing through the axis of one of the trunnions of the carriage, is stopped at the breech where there is an intervening valve, by means of which the fluid may be introduced into, or cut off from, the bore. The projectile is a cartridge of a thin sheet of copper attached to a wooden spar, which at its posterior base perfectly fits the gun, having between the cartridge and the spar an air space to soften the first impulse. The head of the cartridge is of a soft material which, yielding to the shock, causes the plunger which it carries for this purpose to operate against the primer. The centre of gravity is situated behind that of figure with the intention of avoiding the deviations arising from the lateral wind. After the projectile is inserted the valve is opened to discharge it.

In the first trial, made before Lieut. Zalinski,* the representative of the United States Government, a pressure of 420 pounds per square inch was exercised, obtaining a range of one quarter of a mile. They at once constructed another gun of somewhat greater calibre, capable of supporting 2,000 pounds pressure and carrying 24 pounds of dynamite; but neither has the pressure exceeded 500 pounds, nor has the range been greater than 2,100 yards—the degree of accuracy leaving much to be desired. Notwithstanding, as it is possible indeed to increase the former quantities, it appears that they have under consideration another gun for projectiles of 100 and 125 pounds of explosive. But the same inventor has not thought to replace with his gun the pieces of large calibre; having presented it only as a variety of torpedo-thrower, certain ships being applicable to carry it in their sides. For the rest such an invention neither by its arrangement, manipulation, nor effects can be ranked as artillery, nor can we expect from its shots that which we do from projectiles charged with dynamite, as Lieut. Zalinski has reported to his government, and therefore it is useless to discuss it further here, what has been said sufficing to justify its exclusion. †

The project of Mr. Jamotte merits little more than to be mentioned.‡ He censures all idea of employing high explosives in projectiles, and proposes for the occasion, in place of these, balls of leather or linen filled with the same materials, throwing them from highly perfected catapults; although retaining their use to the last period of sieges, and without aspiring to the range, accuracy, and effect, which dynamite shells promise, and which in his judgment cannot be realized.

As soon as the explosive power of dynamite began to be known the thought germinated of employing it as a bursting charge for projectiles, since with it they exploded with great violence, producing a much larger number of fragments endowed with a force of projection notably more great; but the instability of that explosive has not permitted a free and full entrance into the road of investigation, and the isolated and incomplete studies we know of are impregnated with the timidity which this indomitable agent inspires.

The Committee of Defence, at Paris in 1870, proclaimed *à priori* the possibility of employing dynamite in shells, and counselled the advantage of doing it, since with

* Lieut. Zalinski is not understood to represent the Government in this matter.—TRANS.

† *The Scientific American*, received after this article was composed, says that in a recent trial the pneumatic gun threw one hundred pounds of explosive gelatine two miles. The calibre was eight inches and the length sixty feet.—TRANS.

‡ As dynamite, being no respecter of persons, elevates the just and the unjust, no such inspiration as this of Mr. Jamotte has been presented to military men since the days of the historic John Harolson; and, if nothing untoward happened, we must in all candor admit that it might be as successful as the effort of Professor Moses when he elevated Dr. Corah and his unpleasant crowd in the desert.—TRANS.

an equal volume the effects of dislocation were ten times, and the work of projection three times, greater than with war-powder ; but it took care to add guardedly that the dynamite ought not to be very rich in nitro-glycerine, which much reduced the qualities which gave weight to that incorporation. And, in fact, they fired some shells with charges of 200 and 300 (7.5 and 9.5 oz.) grammes of dynamite of fifty per cent. whose effects have been forgotten.

At the same time, in Norway, they fired a few rounds with a Krupp gun of 6.8 inches, testing dynamite projectiles ; but when the charge of gunpowder reached a pound and a half it burst the shell in the bore of the gun, rendering it useless. Before that, in Sweden, they had fired with guns of 18 pounds calibre, using two pounds charge of projection, some shells containing approximately a pound and a half of dynamite. They say that no accident occurred, but neither have the experiments continued nor have they adopted dynamite there for these purposes. In England experiments have also been made without results. In the United States alone they persevere with the hope of success, although not by the ordinary procedure, for there also they have experienced premature explosions and the mutilation of pieces. For that reason they have had recourse to other methods, the one which prevails being that of Mr. Snyder,* in which war-powder serves as the propulsive charge, and the features of the projectile are modified to the point of divesting it of its ballistic conditions. The principle could not be more elemental, viz. : To avoid the shock of explosion, interpose a body that will mollify or reduce it sufficiently.

Mr. Snyder, after having tried in vain a system of accelerating charges, made use, in 1884, of a Rodman gun † of 16 pounds calibre, with a charge of black powder and an ogival shell. This was supplied with a wooden appendage or tail joined to an elastic obturating plug resting immediately against the powder. The plug is composed of four disks of wood ; between the posterior or first and the one following it there is a cup of leather with the border repressed over the lateral surface of the first, and the same between the second and third ; and over the third, which is convex in front, another cup appears covered with a cap of sheet copper, with the border or edge doubled, constituting the true obturator ; and in continuation the last disk is well adjusted to the bore of the gun—the whole being joined together by means of a spindle which traverses them in the direction of the axis.

The tail or spar is a cylinder of wood with some helical flanges like wings, to assure correctness of flight and causing it to gyrate when it strikes the water. Between this piece and the shell is a cylinder of India-rubber, perforated longitudinally in various places, the mouths of the perforations being covered with a metallic lid which embraces the cylinder. This, by its natural elasticity, increased by that of the air contained in the said perforations, contributes to reduce the shock of the explosion. The entire length of the apparatus is 2.75 metres (9 feet), although, for the land service, it appears it may be reduced to less than one metre (3.28 feet) ; the weight is 6 kilogrammes (13.2 pounds). The charge of the shell was 2.268 kilogrammes (5 pounds) of dynamite (probably of inferior quality), and that of projection 1.700 kilogrammes (1.54 pounds) of black powder. Plate 11 explains this very well. It is said that all accessories which constitute the buffer were separated at 200 yards, were collected intact, and that the projectiles attained a range of three quarters of a mile on land and ricochetted in the water. The recoil was very little.

In July of the same year, 1884, other trials were made at Sandy Hook by the

* Mr. Snyder's devices, so far as they are known, have never "prevailed" to any extent in the United States.—TRANS.

† There is no Rodman gun of this calibre. Mr. Snyder first used a 12-pounder Napoleon gun ; then two obsolete cast-iron 24-pounder siege guns, which he burst ; and latterly a Moffatt howitzer, bored up to six inches.—TRANS.

same procedure. The piece was an 8-inch rifle; the shell carried five and a half pounds of explosive gelatine enclosed in a thick paper case, this case being coated on the exterior, and the shell being coated on the interior with graphite *; there was a cushion of cork in the bottom of the shell beneath the case, and a hollow India-rubber cylinder, closed at both ends, between the powder charge and the projectile. At the first discharge the projectile burst against the target without doing any damage, and, at the second, in the mouth of the piece, mutilating the rifling in this part. No detonator was placed in the shell, and we do not know the charge of projection and the distance to the target.

Let us see now the experiments at Point-Lobos, directed by Col. Kelton, in March of this year. He used a 3-inch wrought-iron rifled gun; shells with 200 grammes (7.5 oz.) of dynamite and a variable charge of projection; since in the first round there was little more than 100 grammes (3.75 oz.); in the second than 225 grammes (8.44 oz.); and in the third than 450 grammes (16.9 oz.) approximately. The target was a large rock at 157 yards distance. In the two first rounds the shell burst into innumerable pieces on striking the rock; but in the third it burst within the piece, dividing it into three parts, one of which was thrown 90 metres (295 feet).

Further on we will see the favorable conclusions which common report has drawn from this trial. General Abbot does not find them so satisfactory.

Other trials were made with a piece of 15 centimetres (6 inches), using an explosive charge of 5.4 kilogrammes of gelatine and a maximum charge of prismatic powder for that of projection. The projectile burst on striking the target, destroying it completely and injuring the wall against which it rested. The window-panes of the houses were broken for 300 metres (984 feet) distance. We fail to learn the distance of the target and its strength, which from appearances was not great.

More trials were made during the same month, on the banks of the Potomac, with a piece of the same calibre, the explosive charge being five scant kilogrammes (11 pounds) of gelatine, and the target a large rock at 914 metres (998 yards). The first shell exploded in the target, disorganizing the rock for a radius of 9 metres (29.5 feet), and throwing several tons of material to more than 150 metres (492 feet) distance. The second burst on the stony ground in front, producing a crater of 7.5 metres (24.6 feet) in diameter and 1.8 metres (6 feet) in depth, and throwing the fragments for a distance of half a mile. The other two discharges that were made produced similar effects. Besides the quantity of charge of projection, it would be well to know the nature of the rock.†

New experiments were made in May, near Georgetown, with the object of demonstrating the security of firing which the Snyder system offers, to which system all these experiments relate. The results were like the former.

Nordenfeldt asserts that he has obtained 2,000 feet velocity firing explosive gelatine shells from his 6-pounder gun.

Such are the principal performances investigated, although not with all the details which could be desired to know them thoroughly and to be abie to reproduce them. Before passing any judgment it will be well to show the impressions and opinions of the experts who have studied them prior to and better than ourselves.

* The theory was that the angular velocity might elevate the temperature sufficiently to explode the gelatine. Hence a paper case was used, having two diaphragms, crossing each other at right angles within it; and the exterior of the case and the interior of the shell were coated with graphite as a lubricant. There was enough play between the case and the shell to permit the latter to rotate about the former, so that the gelatine would have little if any rotary motion, and the heat, due to the friction, would have to pass entirely through a quarter of an inch of paper before it could act. The paper was of the kind buckets and car-wheels are made of, and was supposed to be the best available non-conductor.—TRANS. † Limestone, or, rather, Dolomite.—TRANS.

Col. Kelton considered the first experiment at Point-Lobos very satisfactory, where the gun burst at the third round with a charge of one pound of black powder—that of dynamite being seven ounces,—since it demonstrated the possibility of employing dynamite in shells, as well as the great strength of this explosive ; and he estimates that, for the effective use of these artifices, which, according to him, is to destroy ships, one half the length of the projectile is the penetration needed, requiring 0.001 of a second, and he expects that it will be successful.

General Henry Abbot,* a competent authority on the subject, believes that upon explosions, superficial or in contact, of dynamite and its kindred compounds, we are able to found very small hopes, since it is not possible to cause much effect upon iron-clads, for instance, without previous penetration ; and, it being necessary for this to have high velocities of arrival, projectiles of the best steel, and calibres not under 12 inches, we are very far from realizing this much-desired end.

Mr. Jamotte,† the resurrectionist of the catapult, in consequence of judging dynamite shells impracticable, is of opinion that high explosives may be only projected by special processes which eliminate every cause of accidental explosion, it not being worth while to seriously consider them in fire-arms unless said explosives are weak, or loosely packed, in which state they are unsuitable for the object.

Mr. Brialmont takes the ground that if, indeed, charges of dynamite in contact operate efficaciously against earth and stone works, they are not at all formidable against works armed with plate, much less so bursting, as they commonly do, after rebounding ; and that the true projectile, until now not summoned for this purpose, is of forged and tempered steel,‡ impelled with great velocity. He adds that the only positive demonstration of projecting charges of dynamite is that of the pneumatic gun.

The Scientific American, in spite of its affiliation, at present takes the stand that the properties of high explosives will not permit their use in pieces of artillery by the ordinary system of firing, since they occasion the destruction of the guns.

The Army and Navy Journal, speaking of the piece burst at Sandy Hook by a premature explosion, says that the event was entirely in consonance with its predictions anent the subject.

The Army and Navy Gazette maintains that, while dynamite shells have caused considerable destruction against rocks at a short distance, the case of throwing them to a great distance to separate ships, or destroy them if they approach near, requires projectiles with charges of over one hundred pounds ; we being only able to expect, from what we have seen, very small operations by means of boats which can approach vessels of war and surprise them.

According to THE JOURNAL OF THE MILITARY SERVICE INSTITUTION, although the use of high explosives has not appeared impossible in artillery, it is not to be recommended on account of their sensibility to violent shocks.

A French periodical, *The Yacht*, dedicated exclusively to marine matters, believes that high explosives in shells are impracticable, and that they are not superior to those

* General Abbot, in his paper published in JOURNAL OF MILITARY SERVICE INSTITUTION, June, 1885, says : "The use of high explosives in shells requires no new or expensive outlay, for we must have the guns and shells in any event. It only demands *knowledge*, which may be acquired by judicious experiments at no great cost."—TRANS.

† A good catapult, constructed in accordance with Mr. Jamotte's ideas, would no doubt go far towards solving this problem. And, in siege operations, it would be unquestionably efficacious to organize a corps of dynamiters, each man being his own catapult, and carrying the necessary appliances in his hat.—TRANS.

‡ Such projectiles, for this purpose, have already been made in the United States.—TRANS.

commonly in use for that purpose, as much by their inefficacy as by their being a permanent source of danger with their premature explosions. It says that the English have made trials and are persuaded that it cannot be employed in war, and that what has been told about it is American exaggeration entirely in the character of mercantile reclamation.

After the things presented to view, forming the general picture which precedes, the essential conditions of high explosives, their manner of conducting themselves as such, the experiments to which they have been submitted on the proving ground, and the opinion of intelligent persons and of the Press, the insignificant judgment of the subscriber could be well excused. Nevertheless, we will permit ourselves a few words.

Already we have seen that the same properties which we talk about utilizing in dynamite, are identical with those which oppose its use, and this opposition is the more accentuated as those qualities are more intense, because, in fact, the potency of the explosive marches parallel with its sensitiveness. And, to overcome this in the piece, up to this date all efforts have been directed, with the desire at the proper time to utilize it to the best advantage against the target.

From this are derived two classes of investigations and experiments—the one directed to the mode of firing, and the other to that of destroying the object upon which we fire. But both things are joined for decisive effects: compounds very active and in great quantities are required against the target, and necessarily the development of such conditions favors the premature detonations of the charges of the projectiles from the effect of the discharge of the gun. On the other hand, as the charge of the gun is greater, by reason of the distance it is necessary to throw the projectile or the velocity we must communicate to it, more efficacious also will be the injurious effects of the discharge cited.

The problem is confined between the two extremes expressed, and, up to date, it has not been solved, nor is there any likelihood that it can be solved while no other road is followed. The experiments we have reported being analyzed, we see that they have not been able to employ explosive charges sufficient for the destruction of ships, nor have they been able to propel projectiles by means of charges of projection adequate to the ranges and velocities which the projectiles demand in order to be useful. We have seen, besides, that the action of high explosives against plates is much inferior to what was imagined, considering its properties, and, if we must give credit to the report of the experiments, the quantity necessary to sensibly injure ships cannot be contained in the projectiles commonly used; and although this would be mended greatly by penetration, there are two difficulties, seemingly insuperable: 1st. The excessive * velocity which must be impressed upon the projectile, the discussion of which we have just finished; 2d. That, up to date, the dynamite has always exploded on impact, which makes penetration impracticable. This,† apart from the peculiar and natural difficulties attending firing for perforation.

* Señor Carrasco seems to be much impressed with the idea of "excessive velocity." To insure the necessary penetration we must, of course, start with a *good* initial velocity, and this is what we expect to get from a good modern gun, steel projectiles, and improved modern powders now in use.—TRANS.

† Here he is greatly in error. Penetration will undoubtedly take place in wrought-iron plates when *uncamphorated explosive gelatine* is used. This is a matter of record in the United States when eight-inch shells, with solid *cast-iron* ogival heads, were fired from a rifled gun with thirty-five and forty pounds of hexagonal powder. And the penetration was as great as the gun was in the habit of giving when no bursting charge entered the projectile. The shells were weak at the line where the ogival heads were screwed on, penetration took place up to, or near to, this circle, and that is precisely where they broke. Suppose the gelatine had been *camphorated* to that extent, only to be determined by experiment, which would render it most stable, and the projectiles had been of steel of improved pattern?—TRANS.

Certainly the perfect realization of the plans which have been traced, with dynamite for a foundation, would be an admirable thing, capable of changing the principles of war, and inferior only to aërial navigation ; but, admitting that it may not be impossible, to-day it is found in the period of tentation and it would be a vain pretension to think of mastering this subject without departing from the beaten road. Only an extraordinary conception, an inspiration of Creative Genius, excited by the obstacles of war or by the stimulus of interest, will give the solution some day when it is least expected.

We could reproduce in Spain the experiments already known and arrive where the others have arrived, having to stop there as they have stopped, which would in no way advance the question. It would be better to open a contest among the officers of the corps, or of the entire army, offering an actual reward to him who might have the ability, or the good luck, to solve the problem.

Nevertheless, it would be useful to undertake some experiments which would confirm the most important already made, and demonstrate the possibility or impossibility of success. Dividing the question as it stands into action upon the target and mode of firing, and sub-dividing the first part into effects with penetration and without it, perhaps we would be able to arrive at conclusions of some value.

First, we must determine to commence upon the effects without penetration, or in contact, then, if the explosion is verified always on impact or in the rebound after impact, it is idle to occupy ourselves with penetration. In order to verify the experiments on explosions in contact we could conveniently dispose a target plate, and cause to detonate, suspended against it, free charges of dynamite equivalent to those which the ordinary projectiles carry; and, if any charge cause appreciable damage, repeat the operation, separating it from the target small distances, say from 0.02 to 0.10 metres (0.79 to 3.94 in.) to observe the influence of distance. Afterwards another trial could be made, similarly, with the dynamite enclosed in corresponding projectiles. If the results were *nil*, further effort in this direction could be excused, and there would remain demonstrated the absolute necessity of penetration, it devolving upon us then to acquire the certainty of whether it is or is not attainable. Here now comes the part relative to firing.

The programme would be to fire shells charged with dynamite against the target, increasing the velocity until they burst from the shock, or until they penetrated. If the account of experiments made is true, there would be no necessity of going to this extreme, and the impossibility of penetration would remain proved and, at the same time, that of the application of dynamite to the charge of projectiles ; and, in the expectation of this catastrophe, we could make use temporarily of pieces of small calibre, which would offer greater facilities. In the contrary case, viz.: that of penetration, the entire problem would be solved, since, on obtaining it, we would have overcome all the difficulties concerning the firing. And if, before attaining penetration, or explosion on impact, the guns burst, conformably to what has happened up to date, we must seek for pastures new. It is understood that for the last part of the experiments, where firing is required, it is necessary that we should receive more exact information from the aforesaid Snyder system, and models of the apparatus which this inventor has used in the United States.

· CORRESPONDENCE ·

I.

OUR CORRESPONDENT IN JAPAN.

GRAND HOTEL, YOKOHAMA, JAPAN,
May 20, 1886.

NOTHING is more striking to most travellers when coming from the westward, particularly if the last point touched at was China, then the general appearance of the coast of Japan. While there the country is flat and uninteresting, here the first land you make is bold and picturesque. Even the very first islands sighted were covered with verdure and many had their sides sprinkled over with trees of various description. This sudden change from a flat and almost treeless country to one of a picturesque character is most pleasing, and you are anxious to penetrate farther and examine more closely a land which bids fair to furnish so much that is attractive to the eye and agreeable to the fancy.

These most certainly were my feelings as we steamed along the coast and entered the beautiful harbor of Nagasaki, usually the first port touched at when coming from Shanghai. The entrance to the harbor is quite narrow and does not exceed a quarter of a mile in width, but once in, you sail up its beautiful bay, or inlet, which is bordered by high hills and mountains, many of which are terraced and cultivated even to their very tops. I counted the terraces on one of these, and I made over thirty, the sustaining walls of which were of stone and most substantially built.

We came to anchor close to the town and immediately opposite the Bund, or foreign Concession, on which are located the residences and warehouses of the various merchants. Although the day was stormy and rainy, we were not deterred by the elements and were soon on shore, anxious to explore this new city and to make the acquaintance of this, to most of us, new people. We were met on landing by the Jin-rick-sha men, all eager to serve us and almost as importunate as the hackmen of our American cities. And here I think it well to introduce you to this novel species of conveyance. Fancy a large-sized perambulator, or baby-carriage, on two wheels, with a top to protect you from the sun and weather, and with a pair of shafts which are permanently attached to the body. These rest on the ground while you get in, when the man steps between the shafts, raises them to the height of his waist and trots off to your destination. On long journeys and over heavy roads, two men are

necessary, but they are immensely enduring, and these two men will sometimes take you over forty miles per day.

The first places visited were the shops and bazaars, in all of which we were most politely received, the inmates meeting us at the entrance with most profound bows and kindly words of welcome. Nagasaki is quite famous for its work in tortoise-shell, and in one of these shops I purchased a miniature Jin-rick-sha and a model of a native sampan (one of the boats used about the harbor), the workmanship and correct modelling of which were admirably done. Later in the day the clouds lifted and we were able to wander in the suburbs of the city and visit some of the temples and parks. The sites of the former are chosen with much taste and with an eye to the picturesque. Their entrances, especially those of the Shinto order, are usually marked by a Tori-i, or gateway of stone or wood, sometimes called a "bird's-rest," and it usually consists of two upright columns of stone or wood connected by a horizontal bar, the latter turned up at the ends. Passing under this, you proceed on through an avenue of stone lanterns, when you come upon another gateway or shrine, as it frequently has one or more images of their gods on the right and left of the entrance. Passing through this you find on the farther side of the court the principal building or place of worship.

This rather rude description of the approach to their temples may serve as a sample of most, save that in some there are several courts and shrines, some of which are of great richness. From the temple we continued on to one of their tea-houses and places of refreshment, the lady of the house receiving and attending to us in a most kindly and gracious manner, and the waitresses kneeling and making most profound bows—in some instances their heads touching the floor. Tea is served without milk or sugar, and along with it cakes and bonbons. Our departure was attended with the same formal and kindly politeness as on entering. I was unable to express my thanks in Japanese and hence resorted to plain English, but my companion, Mr. Hunt, an old resident of Japan, was able to thank them in their native tongue.

Continuing our walk, we entered a pretty park on the side of the mountain overlooking the city, and commanding a superb view of the harbor and the shipping. We found it planted with a variety of trees and shrubs, conspicuous among which was the the flowering cherry-tree, which is prized by the Japanese for its beautiful blossoms. This tree bears a small fruit, but I believe it is not edible. The cherry-blossom season is made the occasion of numerous out-door fêtes throughout the empire and I think serves as a holiday time for nearly all classes. In the course of our wanderings through this park, we chanced upon a most interesting tablet in stone, which commemorates the visit of General and Mrs. Grant to this hospitable city. It is placed at a prominent point and in a most commanding position. The inscription on it is as below, and they have copied the well-known handwriting of the General most accurately:

"NAGASAKI, JAPAN,
"*June* 23, 1879.

"At the request of Governor Utsumi Tadakalemi, Mrs. Grant and I each planted a tree in the Nagasaki Park. I hope that both trees may prosper, grow large, live long, and their growth, prosperity, and long life be emblematic of the future of Japan.
"U. S. GRANT."

The above is followed by the same sentiment written in Japanese characters. One of these trees is dead, possibly the one planted by the General. The other on the left, facing the harbor, is about 15 feet high and apparently doing well. It was not in leaf when I was there, being of rather a late species and of the variety known to the Japanese as the Kiri, botanically (Paulownia Imperialis). A branch of this tree with its

flowers (of light purple color) forms one of the emblems on the reverse side of the coin of the empire. It was also the crest of the Shoguns, during the reign of that line of monarchs, and is found on the temples and shrines erected in their honor. The peony was also a favorite with the Shoguns, as it now is with the Japanese floristy. The temples at Nik-ko, erected in honor of their great hero, Iye-yasu, displayed some splendid specimens of this flower executed in brass. The flower of the Chrysanthemum forms the crest of the Mikado, and is associated with the Kiri on the various coins, but on all the public buildings and state offices, the municipal buildings, post and telegraph, it stands alone and in some prominent part of the structure. Being of bright gold it is very noticeable. The police wear it on the front of their caps, and it forms the button on the front of the uniform hat or cap of their soldiery.

Before quitting the harbor of Nagasaki, I must say a few words about the little island of De-sima, which was assigned by the Japanese to the Dutch Trading Company, and for two hundred years or more they were confined to this narrow bit of land, 600 feet in length and 200 in width. It is connected with the town by two stone bridges, which are carefully guarded, and its residents were never permitted to enter the city. Their trading vessels were admitted to the factory through watergates which were kept closed. Only a privileged few with the officials had access to the island. The Dutch were forbidden bringing their families, and only a few loose women were permitted to have intercourse with the sailors and factorymen. I presume that it was then these women were taught the dance known as Jonkina or the Nagasaki dance, which is not very moral in its character. The dancers begin by taking out their hair ornaments and in turn each article of their dress is laid aside till not a stitch remains. This performance is now prohibited and can only be given surreptitiously. The ordinary dance of the Ghesa or dancing girls consists mainly of a series of posturings, keeping time with the orchestra in their movements, adding also a skilful and graceful display of fans, or wreaths of flowers, and is as modest as the most exacting could desire. These dancing girls usually form one of the features of most Japanese entertainments, and foreigners are very apt to ask for this kind of amusement among the first. I was present at a very pretty dance given by an American gentleman of the Japanese Legation, which was held in one of the choice teahouses of Tokio (Yeddo). The entertainment was preceded with a sumptuous supper made up largely of fish served in various modes, together with a great variety of sweets. Saké formed the chief beverage, which is brewed from rice. It is a very mild stimulant, hardly containing as much alcohol as light beer, and was served in small cups similar to those used for tea. It has quite a decided flavor and I found it very palatable. After the supper, which was eaten by the various guests sitting on the matted floor, the girls who had served us during our repast formed for the dance and went through the various posturings to which I have alluded. I believe they design to represent certain subjects and figures, but I was not able to make them out. They are accompanied by an orchestra also made up of women, who play upon a kind of banjo and drums, the latter in shape not unlike the ordinary hour-glass. These same musicians also sing in the course of the dance, but in a key that was far from musical to us. Many of us were disposed to liken it to the nocturnal caterwauling of numerous tomcats, but that I presume was due to our uneducated European ears.

The entertainment included also some excellent juggling and specimens of ventriloquism, so that it was some hours before we broke up. Before saying good-night, each guest was presented with a parcel containing his share of the unconsumed portion of the feast, which I presume was intended to be taken home to our friends and the children of the house. So common is this practice, that I have often seen apparently rich Japanese take from the table of a public hotel the share of the dinners not eaten by them.

Wrestlers are often introduced, particularly at day entertainments. It is a popular amusement with the Japanese, and professional wrestlers give exhibits of their strength and skill in various parts of the empire, especially at this season when the weather admits of out-door sports. This is a sight well worth seeing, and I visited in Tokio an amphitheatre that was filled with an immense audience. Those who take part in these games are generally the largest specimens of Japanese men and immensely fat. They enter the ring, which is hardly more than twenty feet in diameter, entirely nude save a loin cloth, and after repeated preliminaries, such as rinsing their mouths and wiping them with paper pocket-handkerchiefs, scattering salt and displays of their limbs and muscles, they throw their bodies forward, rest upon their fingers and toes, and eye each other until the signal for combat is given by the umpire. Then they tackle each other, and their object is not only to throw, but to force one outside the limits of the ring, which, as well as the throw, decides the contest. The winner has to fight in turn others, till he is conquered or comes out, at the end, champion of the day.

But to return to my trip from Nagasaki to this city. We left that pretty harbor after a stay of some twenty-four hours, and in passing down the bay were pointed out the entrance to the ? harbor in which was located the imperial dockyard. I was told that the works covered over six acres, and that the graving or dry dock was very substantially built of dressed granite and was capable of accommodating vessels of great tonnage.

We reached the Straits of Simanosaki after a few hours' steaming, and came to anchor off the town of that name. This is an interesting point, as it commands one of the chief entrances to the famous inland sea, especially when coming from the westward, and separates the large island of Kiu-siu from the main one of Nip-pou, the channel being less than a half mile wide. It is capable of being strongly fortified, and for some time after the opening of Japan to the various powers it was contended that these straits were not included in the treaty, but this was finally decided by the allied fleet, who knocked down the batteries, and ever since vessels have passed freely in both directions. As we were passing the high hills on which the batteries were situated, the captain of our steamer—the *Yokohama Maru*—a royal good fellow and a thorough John Bull—pointed out the sites of the various field works, and at the same time remarked: "The Yankees, while furnishing a very inconsiderable share of the attacking force, claimed a full proportion of the indemnity that was demanded from the Japanese." I could not avoid reminding him that the opening of the country was due to the Yankees, and the firmness and determination of that splendid sailor—Commander Perry, who commanded the Asiatic fleet. But I believe the facts are that no indemnity was insisted upon, but in lieu, the Japanese hastened the opening of one or two additional ports for commerce, etc.

This famous "inland sea" that we are about entering deserves more than a passing notice, as its reputation for beauty and picturesque scenery is almost world-wide. It can hardly be called a single sea, and the Japanese charts divide it into five distinct bodies of water, called repectively, Suwo Nada, Iyo Nada, Bingo Nada, Harima Nada, and Isumi Nada. The islands are most numerous near the narrower points of the channel, and of the 3,000 that are said to belong to Japan, a goodly number are to be found in the course of this sail of about 240 miles. The North Channel, as it is termed, and which we reached early the following morning, has some of the boldest and most picturesque scenery to be found anywhere in the course of this charming trip. Here the ship skirts along the base of bold mountains (many evidently extinct volcanoes), the sides of which were clothed in verdure and often terraced and cultivated up to their very summits. One sees, too, picturesque villages, hidden away,

as it were, in narrow ravines, whose straw-thatched roofs, coming almost down to the ground, forms a pretty feature of this interesting trip. There were also Shinto temples and shrines embowered in groves of trees sometimes perched upon the highest peaks, but always so placed as to give a pretty effect to the picture. As the day was fine, we watched for hours this ever-varied but never-tiring scene, and were rather sorry when, at 4 P.M., it was announced that Kobe (Hiogo) was in sight. We entered its pretty little harbor before sunset and steamed quite close up to the Bund of the European Concession. This is handsomely laid out and bordered by the homes of the foreign colony, which are usually square wooden structures with good wide porches and galleries. We were soon on shore and comfortably housed at the Hiogo Hotel.

The sights of Kobe were soon exhausted, when I started, in company with a pleasant party, for Kioto, easily reached by a narrow-gauged railway, distant about forty-seven miles. The country was looking beautiful, and the numerous fields of wheat and barley, varied now and then by one of rape-seed, whose yellow flower was in full bloom, made the journey particularly agreeable. Japanese cultivation is most thorough, and I hardly think I saw a single weed in the course of the entire ride. By the aid of the numerous mountain streams and a good canal system they are able to irrigate at all times, and it is very common to take off two and sometimes three crops in a single season.

Kioto seems very properly to deserve the good reputation it bears among most travellers, as one of the choice places in Japan. Situated at the head of a rich valley (in fact, the city extends well up the sides of a mountain), bountifully supplied by two or more streams of water, which come directly from the adjacent mountains, and connected with the coast by a well-conducted railway, there are few spots where one is more disposed to linger than this. The city itself is immensely attractive. Having been for many centuries the seat of the imperial government, it naturally attracted the best talent of the empire, and the remains of their work is found in the ornaments and decorations of its temples and the skill of its workmen in various forms of art. The site of the Ya-ami Hotel, where we stopped, was especially good, being at one of the highest points, and commanded a superb view of the entire city, a good share of the valley, and the high mountains opposite. Japanese cities, like those of China, do not furnish much that is attractive in the way of architecture, the buildings being usually hardly more than one story or a story and a half in height and covered with dark tiles, which give a sombre effect. The temples are their largest structures and have enormous drooping roofs that are made striking by deep ridges and upturned eaves. Fabulous monsters are also employed in giving effect to these edifices and crown the ridges. The streets of their cities usually cross at right angles ; are fairly wide and normally well kept. Gutters run on each side and near the walls of the houses. Canals are very frequent in most of the cities I have visited,—Kioto, Osaka, and Tokio (Yeddo) are particularly well supplied,—and greatly facilitate traffic, especially of heavy articles. Many of their store-houses (Godowns) are located on them, and by the aid of boats merchandise is readily and cheaply transported to various sections of the city and to and from the railway stations.

I was nearly a week at Kioto, each day making some new and interesting excursion, such as the rapids of the Katsura-gawa, Lake Biwa, the latter easily reached by rail, which runs through a mountainous district, and past fine plantations of tea. This lake is about the size of Lake Geneva, Switzerland, and is traversed by numerous steamers, rendering an excursion very easy and agreeable.

Nara, distant a day's journey by jin-rick-sha from Kioto, is another interesting point to visit. Many centuries since it was the residence of the Mikado, and one finds there some beautiful scenery and the largest statue of Buddha to be seen in the em-

pire. The most perfect one of bronze, and that most admired, is within a reasonable drive of Yokohama.

On my return from Kioto to Kobe I passed a few hours at Osaka, and there I had a good opportunity of seeing something of the military,—and after visiting some portions of the city—a large one of over 200,000 inhabitants—I directed my guide to take me to the citadel, a strong work for its period and time of usefulness, having a double water-ditch, both ditches riveted with excellent stone-work, and its interior keep, which is on an eminence, protected by massive walls made up of huge blocks of stone. I did not measure them, but, by a fair estimate, should say that there were some blocks that were from 19 to 26 feet in length and breadth by 12 to 14 feet in thickness. How they were transported and handled is somewhat of a mystery. I was very politely received by "Cavre. Pompeo Grillo," "Maggiore d'Artiglieria nell Esercito Italiano," who has charge of the machine-shops of the arsenal, and was conducted through the workshops by Lieuts. Kurigama and Yas Kato of the artillery. I found some massive guns in course of construction, and excellent gun-carriages being made. The machinery, I was informed, came from Italy, and the master-workman was an Italian, but all the other employés were Japanese. Conducted by the lieutenants above named, I then visited the barracks of the artillery, which I found neatly kept and their accoutrements in good order. The horses of the field battery were well stabled and the police excellent. They are the small animals of Japan, some 11 or 12 hands in height and generally stallions. These horses wore iron shoes, but you would be surprised to see how many of them, especially in the mountain districts, are shod with straw sandals. The sandals are kept on by a series of cords, also of straw, which pass around the fetlock. Their bullocks, many of which are used for pack-animals, particularly in the mountains, are also sandalled, the split in the hoof rendering it far easier to keep the sandal in place than with the horse. These bullocks are generally driven by a cord attached to a ring in the nose of the animals, and when they halt for a rest or any other purpose you will usually see the animals tied to a hitching-post, much the same as horses are with us. From Lieutenant Yas Kato I gathered some items relative to the organization of their army, which is modelled after the French system, every able-bodied man being liable to serve for three years after reaching manhood. After this he goes into the reserve. The strength of their active force is kept up to about 40,000 men. The general color of their uniform is dark blue, with facings of different colors to designate the various arms. They still employ a few foreign officers in different branches of the service, such as engineers in artillery, and a few instructors in infantry, but they are dispensing with their services as rapidly as possible. In one of my excursions in the interior of the country I met with a regiment of cavalry and one of infantry on the march. The former were mounted on the ponies of the country, and, like the cavalry of most nations, were supplied with the sabre, carbine, and, I believe, a revolver. As you may imagine, the arms alone made a pretty fair load. The infantry carried breech-loading muskets and a sword-bayonet. The men looked well and seemed very fairly set up. The police force of Japan—and it is a large one—as you meet with numbers in every large city—is available for military purposes. They wear a dark-blue uniform and dark-blue forage caps with the crest of the Mikado on its front. All are armed with swords, and, from the appearance of the men and their general bearing, I should say were selected with considerable care.

Leaving Kobe by steamer, in about twenty-four hours I reached Yokohama, which I made my head-quarters during my stay in Japan. I was kindly taken in hand by two Long Island gentlemen, Messrs. Elliott and Ferdinand Smith, of the firm of Smith, Baker & Co., who did every thing in their power to make my stay agreeable

and interesting. From them I learned much that was instructive about Japanese life, manners, and customs, the head of the firm, Mr. Elliott Smith having been many years resident in Japan.

Yokohama is a capital point from which to make excursions, and some of the most interesting places are within easy reach.

One of the pleasantest of these trips was to Nik-ko, the tomb of Japan's great Shogun, Iye-yasu, whose memory is more revered than any man in the history of Japan. He was canonized after death, and hence a pilgrimage to his tomb became a religious duty. He was a great military hero, and through his efforts the feuds and internal dissensions of the empire were brought to an end, and a long reign of peace and good government followed. There is a Japanese saying, "Until you have seen Nik-ko, don't say keko" (grand or splendid). I was not one to disregard this proverb, and, shortly after arriving in Yokohama, decided on a visit to this beautiful and sacred spot. I was fortunate enough on this occasion to have as companions General Jas. H. Wilson, of cavalry fame during our rebellion, and Mr. Oldman Stevens, of the Japanese Foreign Legation, temporarily called to Japan. Both are excellent fellows and admirably suited in every manner for such a mountain trip as it turned out to be. Securing a good guide named Hakodate, who also filled the position of cook and was generally useful, we laid in a small stock of European stores, as only Japanese food could be found on the journey, and on a bright sunny day started from Tokio (Yeddo) by rail. A ride of four hours through a highly cultivated valley brought us to Utsunomiya, the terminus of the line, when after a comfortable lunch at one of the tea-houses, we started in a species of omnibus for our destination—a beautiful drive of about four hours along one of their national roads. This road is lined through its entire length of some twenty-two miles with magnificent trees called Cryptomeria, a species of cypress or cedar, I could not make out which. However this may be, they are certainly grand specimens of the forest. I measured one and found it at the base nearly thirty feet in diameter. The shade of these is so dense in some places, and the road so worn down by the various pilgrims to Nik-ko, that it is really at times quite dark. However, in the hot days of summer, this would be very refreshing, especially to the weary pedestrian. The rise had been gradual all the way from Tokio, and at Nik-ko I found we had risen about 2,000 feet. The site selected for the tomb of the great hero is certainly a superb one, being in the midst of high mountains cut up by deep ravines, down which run beautifully clear streams of water. Much labor and large sums have been expended upon the avenues which lead to the mausoleums of Iye-yasu and Iye-mitsu, his grandson, and the various shrines and chapels where his admirers are in the habit of offering their prayers are rich in decorations of a costly character. The chapel, containing some of the choice relics of Iye-yasu, is especially interesting, both from its fine interior and from its being the repository of his armor and the various swords that he used. All these were shown us, and I should judge from their size that he must have been rather a large specimen of his race. The tomb, which is the last thing shown the visitor, is reached by a steep flight of stone steps some 200 in number. It is of bronze, cylindrical in form, and terminates in a graceful cap. Bofore it is a table on which is an enormous bronze stock holding a brass candle in its mouth, a bronze incense burner, and a vase with artificial lotus flowers and leaves in brass. These, by the by, are the usual ornaments before nearly all Buddhist shrines and images. The mausoleum of the grandson is similarly placed, and while possibly not attended with so many richly decorated chapels and shrines, is still very handsome. Both owe much of their beauty and grandeur to the superb Cryptomeria that surround them. Our excursion included, beside the above, a trip to Lake Chiu-zen-ji, a beautiful body of water over 4,000 feet above the sea and closed in by high mountains.

From that we crossed the divide into the valley of the Watarassgawa, travelling down it in jin-rick-shas some day and a half. It is a grand stream and furnishes some exceedingly bold and picturesque mountain scenery, and we returned after five days' absence, feeling fully rewarded for any discomforts we may have experienced.

Other excursions were made in the vicinity of Yokohama, notably to Miya-no-shita, a mountain town a day's drive away. It is beautifully situated, and its elevation makes it very desirable in hot weather. The European element of this city are very fond of passing a share of the summer season at its comfortable hotel, and in the midst of its charming surroundings. Frequent trips to Tokio were also made. In one of these expeditions, in which Commander Higginson, U. S. Navy, was my guide, we visited the gardens at Uyeno, a suburb of the city, and where the Shoguns had their royal residence. There is no trace of the latter or of the beautiful temple that was erected by Iye-mitou, but we had the pleasure of walking through the fine park and visiting the museum buildings, which are extensive and contain a far larger collection than I had looked for. In fact it compares favorably with many in Europe.

At a prominent site in the park and close by a large Dai-butsu (bronze statue of Buddha) we were pointed out two trees that the guide told us were planted by General and Mrs. Grant, one a fir and the other a magnolia. Both are flourishing and bid fair to live.

I 'm getting near the last of my visit to Japan, as I sail on the 25th in the *Oceanic* of the Oriental and Occidental line, for San Francisco. Like most round-the-world travellers, I regret parting with this beautiful country and its very polite, amiable, and happy people, as I regard it as one of the most interesting countries I 've seen in the course of my long journey.

Yours truly,

DE LANCEY FLOYD-JONES,
Colonel U. S. Army.

II.

THE OPERATIONS OF 1870 AND 1885 IN THE NORTHWEST TERRITORIES OF CANADA.—A COMPARISON.

From a Foreign Correspondent of Council.

The Report of the Department of Militia and Defence on the suppression of the rebellion in the northwest last year has been published. It contains the full detailed reports of the operations by Major-General Middleton, including the engagement at Fish Creek and capture of Batoche; besides reports by Col. Otter and Major-General Strange, commanding columns; the report of the Director of Stores; preliminary report of war claims; and very detailed statements on the subject of hospital arrangements. The book is also furnished with a plentiful supply of plans and sketches.

It is curious to compare these operations of 1885 with those which took place in the same part of the Dominion in 1870, previous to the construction of the Canadian Pacific Railway.

In 1870 a force numbering about 1,170 officers and men, and consisting of three battalions of infantry, with detachments of artillery, sappers, hospital corps, etc., was concentrated at Toronto. Fort Garry, on Lake Winnipeg, being the objective, it became necessary to construct 200 boats of a special plan for the water transport of the expedition, and an auxiliary train of 150 horses and 16 span of bullocks was organized for the land transport.

On the 16th of May, 1870, the expedition began to leave Toronto. From thence to

Collingwood on Lake Huron the railway was used; and from Collingwood to the western end of the lake the troops were conveyed in five steamers chartered by government. From this point the troops and stores were transported by land to the shores of Lake Superior, whilst the steamers made use of the canal, which was situated in United States territory. The farther end of Lake Superior was not reached by the first detachment until the 25th of May.

At this point—Thunder Bay, in Lake Superior—difficulties increased rapidly. Heavy rains destroyed the track; forest fires impeded the work of road-makers. It became necessary to again take to the boats. From the shores of the lake to the river Matawan material went by land, the flotilla by water. Here the material was again embarked, but for a distance of only two and a half miles. Stores are once again transported by land to Calderon's Landing; now again all pass by water to the river Ostondagee. From this river, for a distance of five and a half miles, boats and their cargoes are carried on carriages by land, and for the last three or four miles to the Lake Shebandowan, water transport is again in use.

The advanced detachments thus did not reach this point until the 26th of July. A month and a half was occupied in a journey of about forty-eight miles.

Each boat was thoroughly equipped, and carried eight or nine men, two voyageurs, with more than sixty days' rations for each man, besides one hundred cartridges.

The column was now echeloned on a distance of about 150 miles.

The advance was continued, and the advanced guard reached Fort Frances on the 4th of August; thence to Fort Alexander by the route of the Rainy River and Lake of the Woods. On the 20th of August the seven companies of regulars (60th Rifles) and artillery and engineers were concentrated at the latter place. On the 24th of August Fort Garry was reached, but Riel and his followers, refusing to submit to the ordeal by fire, had escaped across the border.

* * * * * * * * * *

In 1885 Riel was again at the head of a band of rebel half-breeds, but this time his head-quarters were on the Saskatchewan River, some five hundred miles west of Winnipeg. Winnipeg was again the primary objective, but on this occasion troops and stores were transported from the east to this point by the Canadian Pacific Railway. The concentration was to be made at Winnipeg, and individual detachments occupied eight to ten days on the journey. Troops were sent from all parts of the Dominion, even as far east as Halifax, Nova Scotia; and the order calling out the first troops being issued on March 27th, a force of 251 officers and 3,042 men, with horses, guns, and stores, had reached Winnipeg by the 20th of May.

The Toronto troops, under Col. Otter, numbering about 600 men, left head-quarters on March 30th, and arrived in Winnipeg on April the 7th and 8th, covering a distance in nine and ten days which had, fifteen years previously, required more than three months for the journey of a force only slightly larger in numbers.

Towards the middle of April the total number of men under arms in the Saskatchewan country was about 5,500. This force was divided into three flying columns, and detachments were left at various places for safety of communications.

These three columns acted in all respects independently.

The right column, under Gen. Middleton, about 1,050 men, left head-quarters at Fort Qu 'appelle (on the railway, about 350 miles west of Winnipeg) on April 6th, marching northward to the river 211 miles. The enemy was engaged on the 24th at Fish Creek, and dispersed with a loss to the militia of 10 killed and 40 wounded, about 350 men being engaged. A delay of several days took place here whilst waiting for supplies. The advance was made on the 7th of May toward Batoche, the rebel stronghold, with a force of 724 men. Desultory fighting took place on the 9th, 10th,

and 11th, in front of the rebel position, and on the 12th of May the place was captured. The force engaged numbered 495 men, and the casualties in the four days were 8 killed and 46 wounded.

The centre column, under Col. Otter, about 550 men, left head-quarters at Swift Current (on the railway, about 200 miles west of Fort Qu'appelle), on April 13th, and marched north to Battleford on the river, 203 miles, arriving there on the 23d. Men were mostly carried in wagons. On the 1st of May a reconnaissance was made to Cut Knife Hill with about 300 men to prevent the junction of Big Bear and Poundmaker. The enemy's camp was reached at daybreak on the 2d of May. After six hours' fighting the force withdrew with a loss of 8 killed and 14 wounded.

The left column, under Gen. Strange, about 650 men, left head-quarters at Calgary (on the railway, about 300 miles west of Swift Current) on the 20th of April, and marched north to the river at Edmonton about 194 miles, reaching that place on May 5th. An advance was made down the river towards the centre column, and Fort Pitt reached on May 25th. From there a reconnaissance was made to a position about 12 miles northeast of the fort where Big Bear was entrenched. The position was found impregnable, and Strange's force retired with a loss of 3 men wounded. Three hundred were engaged.

The rebellion virtually terminated with the capture of Riel at Batoche on the 13th of May. Gen. Middleton followed Big Bear without success. He was, however, captured later by a body of police.

Thus, in a little over six weeks from the time of first despatch of troops, the operations were brought to a successful conclusion.

The distance covered by some of the troops was very great. The Halifax battalion reached a point about 3,000 miles west of their head-quarters.

The transport question, so difficult in 1870, presented few obstacles in 1885. The railway formed the base of supply from which each column started. When the troops left the railway they were accompanied by wagons and carts provided by the Hudson's Bay Company, to whom a contract was given for supply and transport by government.

Two-horse four-wheeled wagons, about 10 feet six inches in length and 3 feet 4 inches broad, were chiefly employed. These carried a load of about 2,500 to 3,000 pounds 20 to 30 miles a day. A few ox- and pony-carts were also used, with a load of about 800 pounds. The price paid for hire by the company was from $5 to $10 a day. The company found considerable difficulty in providing the required number of teams.

As regards supply, all was provided by the Hudson's Bay Company, from their own stores in the country, supplemented by relays from the east. Fresh beef, canned meat, bacon, biscuit, flour, etc., were the chief provisions, and on no occasion was there any scarcity.

With an enterprising enemy some difficulty might have been experienced in guarding the large convoys passing between posts on the lines of communication from the railway to the north. On one occasion Big Bear succeeded in capturing a train of 20 ox and 3 horse teams.

The employment of civilians as teamsters and the placing large contracts in civilian hands may be successful in small operations of this kind, as shown in the present instance; but it may be remarked that Col. Smith, who was detached on board the steamer "Northcote," to operate in conjunction with the right column at Batoche, records his failure to appear at that place as due to the fact that the master, pilot, and engineer were aliens, and the crew civil employés. The fact of there being a strong carrying power in the country represented by the Hudson's Bay Company, warranted

the reliance placed upon it by government. Perhaps the weakest spot in the Canadian militia system is the total absence of any nucleus of transport. Peculiarly happy circumstances on this occasion enabled the difficulty to be easily overcome.

The hospital arrangements were well and carefully planned and carried out by Dr. Bergin, who was appointed Surgeon-General. No establishment whatever existed at the commencement of operations. Two field hospitals were formed, each capable of division into four parts, each part forming a complete hospital of fifty beds, and a base hospital at Swift Current, afterwards transferred to Moosejaw, Dr. Bergin makes many excellent suggestions for the formation of a medical staff corps, and in conclusion renders his thanks to Purveyor-General Baxter, of the U. S. Army, for hints and suggestions made by him.

E. N.

July 7, '86, KINGSTON.

III.

THE ARMY AND THE PEOPLE.

(*An Edited Letter.*)

The reasons presented for an increase of the army are very cogent; particularly those on page 21 (Military Monograph, No. 3). There lies the danger to free institutions in this country, and not in any probable growth of the military branch of the government. The army is inadequate to the present legitimate demands upon it, —still more so if any attempt should be made to make it subserve the useful domestic purposes indicated in the Prize Essay of THE MILITARY SERVICE INSTITUTION for 1884, leaving out of consideration altogether the contingencies of foreign war and internal disorders.

With most civilians I am very jealous of the military power; in a republic it needs to be guarded with the greatest care, but it might be considerably increased without fear of any bad consequences; and, if the closer relations with the people which the essay discusses could be brought about, it would be difficult to draw the danger line.

While commending the essay, I beg leave to point out two errors into which Captain Price has fallen,—one of fact, and the other of deduction. He misstates (pp. 17, 18) by implication, at least, the position that was taken by the secessionists—that is, of those who held to the theory of secession. Their theory, in brief, was that the Union was the result of a compact between independent sovereignties, by which certain powers were delegated, for the common welfare, to the general government; that all the powers not thus delegated were reserved to the several States, and amongst these reserved rights was the right for each State to judge for itself as well of infractions (of the compact) as of the mode and manner of redress—and hence, if they deemed the occasion called for such an act, that they had the constitutional right to withdraw from the Union. But the simon-pure secessionist—that is the one who claimed the constitutional right of secession—utterly repudiated the doctrine of nullification, which was that a State could remain in the Union and still nullify its laws. I infer from what Captain Price has written that his idea is that nullification and secession, as these doctrines were intertwined in the South, were the same thing. There were few nullifiers except in South Carolina and very few in that State after 1839.

The error of deduction is on page 18, when in considering the economic views involved in the question of an increase of the army, Captain Price says that these "do not represent any degree of practical economy as the money that may be expended to sup-

port soldiers . . . returns to the people from whom it is taken." Now this reasoning would equally support the maintenance of the large armies of continental Europe, which have been, and are, such a heavy burden to the people. The fallacy lies in the exclusion of the fact that a soldier is a non-producer, and that the larger portion of what the government expends upon the soldier is consumed in the use. If the people were taxed only for the purpose of paying the soldier his wages, that of course would remain with the people from whom it was taken, and they would not be any poorer; but in direct proposition to the increase of the army is the increase in the burden which the residue of the people must bear, subject of course to the limitation that without a government we could not enjoy any thing we have, and that the amount we pay for a government is not to be considered a burden, but the condition upon which we remain secure in person and property. The moment, however, the government enlists one more soldier than is necessary to give us this security—that is, to maintain and enforce the laws—a burden is imposed upon us for which no justification can be found in political economy or in morals.

ONE OF "THE PEOPLE."

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REVIEWS.

The Lessons of the War—Command.

(*Second Paper.**)

HAVING reached the wise conclusion referred to at the close of my first paper, the President would have strengthened his armies in the field could he have enforced this idea upon his subordinates in the War Department. Before proceeding to illustrate further the evils of a violation of this lesson I will cite an example of advantages flowing from an observance of its principles.

In January, 1862, Gen. Jos. E. Johnston was in command of the Department of Northern Virginia, with a District, in the valley of the Shenandoah, under the command of Gen. T. J. Jackson (Stonewall) with a subordinate, Gen. Loring, in command of a force at Romney, W. V. On the 30th of January the following dispatch was sent Gen. Jackson (p. 1053, vol. v. "Official War Records"):

Richmond, Va., January 30, 1862.

Gen. T. J. Jackson,
Winchester, Va.

Our news indicates that a movement is being made to cut off Gen. Loring's command. Order him back to Winchester immediately.

J. P. Benjamin,
Secretary of War.

Promptly the next day the following was sent:

Head-quarters, Valley District, Winchester, Va.,
January 31, 1862.

Hon. J. P. Benjamin,
Secretary of War.

Sir.—Your order requiring me to direct Gen. Loring to return with his command to Winchester immediately has been received and promptly complied with.

With such interference in my command I cannot expect to be of much service in the field, and accordingly respectfully request to be ordered to report for duty to the Superintendent of the Virginia Military Institute at Lexington, as has been done in

* Continued from p. 90, No. xxv.

the case of other professors. Should this application not be granted, I respectfully request that the President will accept my resignation from the army.

I am, sir, very respectfully your obedient servant,

T. J. JACKSON.

Maj.-Gen. P. A. C. S.

This was followed the next day by a letter to Johnston (p. 1056), recommending that Loring's command be ordered back to Romney, which was referred to the Secretary of War. "Whose orders I cannot countermand."

J. E. JOHNSTON, General.

Then came a personal letter to Jackson (p. 1059) and one to President Davis (p. 1062), in which the pertinent remark is made: "The responsibility of the command has been imposed upon me. Your Excellency's known sense of justice will not hold me to that responsibility while the corresponding control is not in my hands." (See also Gen. Johnston's letter on p. 1057 and also Jackson's on p. 1062, in which he speaks of "prosecuting the war upon a ruinous principle.")

It was with considerable difficulty that Jackson could be induced to withdraw his resignation. The prompt stand taken by these two officers and the earnestness with which they protested against a "ruinous principle" did much to put a check upon such interferences, unhappily, at a later date, so prevalent in our own army.

As spring opened and the operations on our part, as related in the first paper, commenced, Johnston's army having fallen back behind the Rappahannock, Jackson was left in the Valley of Virginia in a comparatively isolated position, although not as an independent commander. It will be perceived (p. 913, vol. v.) how differently the Richmond authorities acted in arranging their departments or districts in the fall of 1861 from the plan pursued in Washington, where the same course was not adopted until after defeat and disaster had demonstrated to President Lincoln its absolute necessity.

By Jackson's prompt and vigorous action of the 31st of January, regarding outside interferences, he succeeded in establishing, so far as he himself was concerned, a freedom of judgment and independence of action destined to bear important fruit. His correspondence with Johnston and Lee, two distant commanders, is marked by the utmost spirit of subordination on his part and the greatest confidence and trust on theirs. From *Swift Run Gap*, just east of Harrisonsburg, he submitted his plans, in the rough, to Lee (p. 872, vol. xii.), who, two days afterwards (p. 878), wrote he was unable to send him any reinforcements, and of the three plans suggested by Jackson, told him: "*I must leave the selection of the one to be adopted to your judgment.*" But hinted at his preference for one of them. *This hint* was *sufficient* for Jackson, and early in May he proceeded to act upon it with that untrammelled independence so essential to success.

In order to understand clearly Jackson's operations, it is well to look at the positions of our forces and his own. Early in May McDowell was collecting his force at Fredericksburg; Shields' Division from the Shenandoah Valley being on its way there. Banks, with his army, was at Newmarket and Harrisonsburg with orders from Washington to fall back down the Shenandoah Valley to Strasburg and fortify. Fremont, with his army, was west of the Shenandoah Mountains at Petersburg, and Franklin, with his advance under Milroy, at McDowell, thirty miles west of Staunton, and twenty miles south of Franklin. Confronting Milroy, on top of the Shenandoah Mountains, was Edward Johnson with two thousand five hundred men. Jackson, with between eight and nine thousand men, was near Swift Run Gap, in the Blue Ridge, watching Banks at Harrisonsburg and Newmarket to the north and west of him, whilst Ewell's Division, of about the same strength, was east of the Blue Ridge.

Suddenly Jackson's force left the position near Swift Run Gap, marched rapidly ***southeastwardly*** (towards Richmond), apparently abandoning the Valley of Virginia. On reaching the railroad at Gordonsville, however, his troops were embarked on the cars, run *west* to Staunton, disembarked there, and pushed rapidly *westward* to unite with Johnson's force. The combined forces now moved forward to McDowell on the 8th of May, struck Milroy's force, increased by some of Schenk's, which, after a heavy fight, fell back that night on Franklin—northward. Jackson followed for some distance, then, leaving his cavalry under Ashby as a veil, he retraced his steps, but instead of returning to Staunton, took a pass farther to the north, reached Harrisonsburg in the Shenandoah Valley, pushed on to Newmarket, turned to the eastward, crossed the Massamitten Mountains and the south fork of the Shenandoah River, and, being joined by Ewell's Division, had reached Front Royal, captured that place—with the troops, which had been sent there by the direct order of the Secretary of War! (p. 522, vol. xii.), flanking Bank's main force at Strasburg before Fremont well knew he had left ***his*** front (May 23d—p. 208, vol. xii.). Turning now northward towards Winchester, Jackson struck a portion of Bank's force in flank, pursued his army through Winchester, forced it across the Potomac, and threatened Harper's Ferry. During this time his cavalry and scouts were keeping him well posted regarding the movements of our troops, and knowing thoroughly every foot of the valley of Virginia, he was able to plan skilfully the movements for his escape. On the 30th he was back at Winchester, and the next day reached Strasburg, near which point Fremont's advance, coming over the mountains from the west, was met, thrust back, and Jackson's whole command being now re-united, he continued his retreat up the valley. On reaching Harrisonsburg he turned south, and at Cross Keys, four miles distant, took up a position on the 8th of June, just one month from the battle of McDowell, and offered battle to Fremont, having in the meantime destroyed all the bridges over the Shenandoah River, thus preventing any junction between Fremont west of the stream, and Shields on the east of it. Of Shield's movements Jackson had informed himself. The very day of the battle of Cross Keys, Shields' scouts reached the bridge in Jackson's rear, over the south fork of the Shenandoah River, followed by the head of Shields' column, and our troops actually got into Port Republic, but Jackson quickly drove them back and saved the bridge so necessary to his retreat. That afternoon he received the attack of Fremont at Cross Keys, repulsed him, and that night moved all of his troops except Ewell's Division to Port Republic, crossed the river the next morning, attacked Shields' advance, and, after a heavy fight, forced it back, pursuing it several miles, and then falling back reunited his command in the forks of the river.

In the short space of a month this commander, untrammelled by outside influences or orders, had, with inferior forces, disastrously defeated one army, forced back another, and scattered a third in hopeless confusion. Without detracting from the military character of Jackson at all, it must be remarked that his opponents were heavily handicapped at the start by the dictation and interference of the authorities in Washington, and that from similar interference from Richmond he was entirely free. ***He had unlimited control of his forces.*** He was intimately acquainted with every feature of the country in which he was operating; in fact that was one principle reason for sending him there (p. 909, vol. v.). If there ever was a case exemplifying and enforcing the lesson I have endeavored to impress, it is that of Jackson. The results of his operations were not confined to those immediately attained by his forces, but extended to others far beyond his immediate field, and determined the whole character of the campaign of that year. Inspired by his successes, Lee at once sent him strong reinforcements (p. 910, vol. xii.), a knowledge of which fact paralyzed our

forces and kept up the apprehension of another advance by Jackson until he was well on his way to Richmond to aid Lee in his attack on McClellan. The reinforcements were sent him on the day after their arrival, on the way back to Richmond with Jackson's army. With these reinforcements, as is well known, Lee was enabled to attack McClellan and raise the siege of Richmond. Thus did our enemies themselves impress upon our minds the *first great lesson of the war.* . . .

INGALLS' "EXTERIOR BALLISTICS."*

Captain Ingalls in this work, a part of the course of instruction at the Artillery School, has given us a thorough treatise upon the motion of projectiles in the plane of fire. Beginning with a few preliminary definitions, the book proper is divided into two parts.

I.—This treats of the resistance of the air. Stating that the molecular theory of gases is not at present sufficiently developed to be made the basis for calculating the resistance that a projectile experiences in passing through the air, the author proposes to make no attempt to determine the *amount* of resistance but to deduce an approximate *law* for it. After the well known discussion of the resistance to the motion of a plane surface normal to the direction of the motion, in which it is found that this resistance, P is proportional to the area of the surface, the density of the medium and to the square of the velocity, he discusses oblique motion and adopts for the normal pressure Poncelet's empirical formula $P = {}_1 \frac{{}_2 P S}{x \sec.^2 E}$ and applies this formula to pressures on surfaces of revolution and to projectiles of differently shaped heads. Theory requires that the resistance should vary as the area of the greatest transverse section of the projectile and also as the square of the velocity; experiment has shown, however, that the latter obtained only for very low and very high velocities. After referring to the experiments of Robins, Hutton, and Didion, to determine the law of resistance at various velocities, the experiments of Mayevski, at St. Petersburg in 1869, with spherical projectiles to determine P or rather the values of $P^1 = \frac{P}{N R^2 V^2}$ are discusssed. A general outline of Bashforth's methods of determining his co-efficients, based upon the supposition that the resistance varies as the cube of the velocity for all velocities, is also given. Difficulty being experienced in determining this resistance as a continuous function of the velocity, it is usually expressed by powers of the velocity with constant co-efficients taken so as to represent the mean resistance over an ascertained range of velocity. Captain Ingalls determines the laws of this resistance by taking the formula $P = \frac{d^2}{g} A\ f\ w$), in which d represents the *diameter* of the projectile *in inches*, and calculates the values of A, using Bashforth's co-efficient K; ballistic tables, thus computed for oblong and spherical projectiles are annexed to the work. An explanation and use of the ballistic co-efficient follows.

II.—Under the head of motion of projectiles after reducing and discussing the usual equations of motion, the methods and formulas of Bashforth, Niven, and Siacci are explained and examples of their employment in solving problems are given; a full discussion of Siacci's equations for direct fire and their use with the ballistic tables complete the book. Within the limits of a book review it is impossible to do full justice to this work; the student, familiar with the higher mathematics and disirous of the latest information upon the subject-matter, will find that this book, in connection with Mackinlay's work,† so often referred to by Captain Ingalls will give him a thorough knowledge of the present status of the solution of ballistic questions.

O. B. M.

* "Exterior Ballistics." By James M. Ingalls, captain 1st artillery. Printed at the United States Artillery School, 1885.

† "Text-Book on Gunnery. By Captain G. Mackinlay, Royal Artillery, London, 1883.

Rosengarten's "German Soldier."*

This is a handy little volume of 175 pages, replete with interesting information, not only to the German, but also to the general reader. It consists chiefly of short biographical sketches of the many distinguished Germans who have been identified with our military history, and its value as a book of reference is greatly enhanced by an excellent index. We have no means of verifying its biographical correctness, and could wish that some of its more striking statements were supported by references; but the author evidently aimed at accuracy, and drew his data from sources worthy of credit.

That Germany should have been largely represented in all our armies is not to be wondered at in view of the large German element in our population and the known military spirit of the race; but that so many purely German organizations existed during the Revolution and the Rebellion is apt to astonish those who have not given special attention to the subject. In both emergencies our citizens of German blood stood shoulder to shoulder for the flag of their adoption, and did good service. The military education which many had brought from Fatherland was a capital which these emergencies made invaluable. It was the leaven which transformed men into soldiers, and it was rather unwise to hold it together in heaps. Better results would have been obtained if it had been distributed more evenly. The great amalgam which constitutes our nation should not be permitted to resolve itself into its original elements whenever a national emergency arises. That it has a tendency in this direction our author unintentionally but forcibly presents, and statesmen should take notice in time and devise a remedy.

C.

Owen's "Washington Artillery."†

The future historian of our Civil War will not be stinted in the matter of material. Already a respectable library of war literature might be collected, and every year adds a new crop of books. The volume before us belongs to last year's crop, and while it can hardly be called history in the strict sense of the term, it is decidedly a book for "The Boys," for whom it was evidently intended. Except that the language is somewhat superlative, the descriptions of battles, as seen from the author's point of view, are decidedly realistic and generally interesting; but wherever Rumor is permitted to use the recording pencil Exaggeration creeps in. Then, what "Bliffkins" said and did, and the fact that "Hettie is as charming as ever," can be interesting only to the parties alluded to and their friends.

Again, the enthusiasm which inspired the author as he recorded, from day to day, the words and deeds of his comrades, is apt to be called vainglory by unsympathetic outsiders. The first impression produced by a perusal of the book is, that the principal part of the fighting, on the Southern side, was done by the Washington Artillery; or, as Governor Lee puts it—"That the Civil War was simply a difficulty between the United States of America and the Washington Artillery of New Orleans."

In many otherwise excellent passages exaggeration is permitted to disfigure what simple truth would have sufficiently adorned. The Trumpet of Fame should be at disinterested lips when it attempts the higher notes of the gamut. Imagine "Horatius, who held the bridge in the good old days of Rome," boasting that he had overcome an army single handed.

* "The German Soldier in the Wars of the United States." By J. G. Rosengarten. Published by The J. B. Lippincott Co. Philadelphia, 1886.

† "In Camp and Battle with the Washington Artillery of New Orleans." By Wm. Miller Owen.

Nevertheless, it is well that such books should be written. They will give succeeding generations a glimpse of army life, which is rigidly excluded from official reports, and seldom finds its way into legitimate history.

C.

Recent Military Fiction.

The growth of military fiction in America has been necessarily slow, for reasons which hold good perhaps with relation to the growth of other things military. In time of war there is a mushroom growth of books, with lurid covers, and blood-curdling titles; but of clever, wholesome, realistic novels, written by soldiers who "have smelt powder," or by kith and kin of Uncle Sam's defenders, there is scarcely a baker's dozen.

It is but the other day that Marryatt and Lever and Cooper were almost the only romancers whose works had the true flavor of camp and quarter-deck.

A recent writer calls attention to the decline in quality of British fiction, and the wonderful strides American novelists are making toward first place in the world's esteem. And this is certainly the case with our military novelists.

The most brilliant writer, so far, in this field is Captain King of the United States Army, now on the retired list for wounds. Three army novels bear his autograph.

The book before us * may be called a true story of army life on the frontier, painted in warm tints, with a judicious, intermingling of cooler tones. The only carping criticisms we have heard were that the artist was (like the Tennessee authoress) too fond of his landscape, and that he did not give the *infantry* a show—used too much yellow ochre. However it was a pale-blue dough-boy who objected, naturally.

This, the author's third venture, we believe, shows increasing strength in treatment. His first book has been translated into German.

"Barbara's Vagaries"† is in lighter vein, and treats of the possibilities of a summer campaign at Old Point. Its heroine is unconventional, a wild-rose among the hot-house flowers found in profusion at the Hygeia, and her experiences are described in a charming story by the wife of a distinguished artillerist.

In "Cut,"‡ which purports to be a story of West Point life, we recognize a foundation of truth buried under a superstructure of very poor fiction.

R.

"The Southern Bivouac."

We are in receipt of a bound volume (I.), New Series, June, 1885, to May, 1886, of that welcome exchange, *The Southern Bivouac*.‖ Here may be found much of historical and literary value, illustrated by portraits and handsome maps. It is a valuable Intelligence Bureau for the collection of personal reminiscence of more or less worth to the coming Napier of our Great Struggle. Of these granaries there cannot be an excess.

R.

* "Marion's Faith," by Charles King, U. S. A. Philadelphia: The J. B. Lippincott Co., 1886.

† "Barbara's Vagaries, by Mary Langdon Tidball. New York: Harper & Brothers.

‡ "Cut," by C. I. Cervus. Philadelphia: The J. B. Lippincott Co.

‖ *The Southern Bivouac*, a monthly magazine, vol. I. Louisville: B. F. Avery & Sons, 1886.

Camp-chest

STREET LESSONS.

Two boot-blacks are established on the sidewalk in the Broadway block just above the Battery. One is an Italian, the other a typical colored man of the olden time, whose chair stands between the door and window of a half-basement room used as a restaurant. I patronize Uncle Jonah, the colored man, but upon one occasion I inadvertently stopped at the Italian's. On a warm day soon after, I dropped into Uncle Jonah's chair as usual, but instead of going to work promptly, he looked me straight in the face, and with a heavy cloud upon his brow, said: "Did n't you see me standin' heah daybefo' yistehday when you stopped at dat Italian's?" I replied that I had not noticed him. "Well," said he, "I was right heah in plain sight, and I don't see how a gentleman kin give his work to eh Italian, when a reg'lar-born 'Merican is eh standin' round waitin' for eh job." Thinking apparently that that was enough for me, Uncle Jonah, as he went vigorously to work, said to a twelve-year-old wandering "shiner," who loitered up into the shade with his box under his arm "Now, young man, ef ye stay by me while I shine dis par ob shoes ye may larn somethin' ye did n't know befo'." The boy listlessly dropped his box and perched upon it with his back to the open window of the restaurant, which Uncle Jonah was facing. He wore only a cap and shirt, and a pair of trousers which drew tightly around the hips as he sat drowsily watching Uncle Jonah's work. All at once the boy uttered a shriek, sprang into the middle of the street clapping his hand to the seat of his trousers as he went and calling out half crying and half yelling: "That d—d rascal stuck a fork in me an inch deep!" Uncle Jonah, without interrupting his work or raising his head, said coolly: "Young man, ye fo'got yo' box," adding, as the boy came cautiously back rubbing the wound: "I tole ye, ef ye would stay by me while I shine dis par ob shoes ye might larn somethin'. Yer know mo' now dan yer did befo', don't yer?" I was indignant at the cruelty and threatened to call a policeman and have the offender arrested, but Uncle Jonah—who holds his franchise at the will of the restaurant-keeper—said: "O no, sah, de waiter did n't mean nothin' by it; I seed de whole bisness—de boy was a shettin' out de light from de window, whar de folks hav to see to eat, an' de man did n't use no fauk on him. It was only a big pin he had fastened on de eend of de broomstick, an he did n't run de pin in him much more 'n half way. He was only foolin'!" "If it had been your ham 'stead of mine that the fork was stuck in, you would n't have thought it was foolin'" said the boy. Seeing me hand the boy a dime as I started away, Uncle Jonah said in the tones of a parson: "Thar, young man, dat is salve to keeo yo' so' place, and mind you don't set down befo' dat winder no mo'." "*You* BET!" was the answer. One object-lesson is enough for the *gamin*. J. B. F.